

The Iron Age

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New Emery-Wheel Tool Grinders.

We illustrate on this page two new tool grinders built by the Springfield Glue and Emery-Wheel Co., of Springfield, Mass. Large emery-wheels, made especially waterproof, are used and arranged for grinding on the front side of the wheel, or on both the front and back sides, thus enabling front or back grinding, as may be desired. The machines take up little room and are claimed to make less dirt than ordinary grindstones, and the workmen stand nearer the wheel, enabling them to more closely watch the work. The grade or coarseness of grit and any degree of hardness can be regulated and adapted to the kind of work to be done. The emery-wheel is made of emery and corundum, crushed down from large pieces by improved machinery to give each grain the most possible cutting corners. The particles composing the emery-wheel are sharp cut, and, being five or six times harder than those of an ordinary grindstone, are claimed to do so much more work. Thus a grindstone 3 feet in diameter, making 70 revolutions, gives 660 feet per minute of grinding surface, while an emery-wheel 2 feet in diameter can safely make 550 revolutions, and thus give 3460 feet, or over five times the grinding surface per minute of harder and

successfully at the yard of John Elder & Co., Govan, near Glasgow, the 22d inst. The dimensions are as follows: Length 460 feet, breadth of beam 30 feet, depth of hold 38 feet, tonnage 6000 tons gross. Her engines are 8500 horse-power and triple expansion. The vessel is built of steel, has four masts, steam steering gear, and her propeller is of manganese bronze, a very flexible metal peculiarly adapted for propellers, as it bends to almost any extent before it breaks. The application of this material to the purpose is comparatively new, but is believed to furnish an important additional safeguard against accidents.

The Sims Torpedo.

At last the United States Government has adopted the Sims electrical fish torpedo as the main defense of the coast in the absence of proper batteries. When long-range guns are procured, if Congress can ever be awakened to a large enough patriotism to grant sufficient money, the two systems of defense will be combined. If a hostile man-of-war should come within long range of New York to-morrow there would be a lively little something frisking about the water, with 400 pounds of dynamite in the

This float may be riddled with shot and yet it will stay on the surface and support the submerged torpedo.

The float and the torpedo below it are connected together by steel stanchions. On top of the float are two rods or guides, surmounted by balls. These indicate to the operator where the torpedo is. They are hinged to the float and are kept upright by springs. When the torpedo dives under or cuts through an obstruction the springs allow the guide balls to lay in a socket, and to stand upright again when the obstruction is passed. The whole apparatus is provided with a steel propeller and rudder. The torpedo may force its way through cables or similar obstructions by means of a sharp, strong blade which forms the prow, and which is set at an angle of 60°, like the ram of an ironclad. This angle gives the knife great power in cutting, especially as the structure moves with great speed. Not only does this formidable prow serve this purpose, but, when it strikes a spar or any other floating barrier, the slant makes the whole vessel dive under, and its buoyancy enables it to rise on the other side as it continues on its course toward the object of its attack. The torpedo is extremely simple in its construction. The gross weight is about 4000 pounds but when taken apart

course. When it is desirable to change the course the operator moves a small lever on the key-board and the current passes into one magnet or the other and the rudder is pulled about in the proper direction.

A rate of over 11 miles an hour has been attained in repeated Government tests, and the officers who have been experimenting for years with the torpedo say that it will be easy to get a still higher rate of speed with the same apparatus.

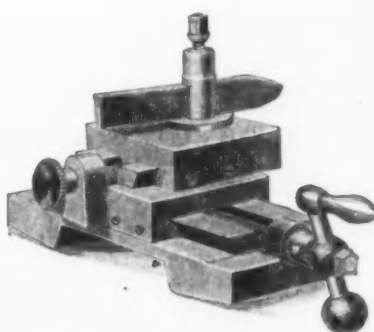
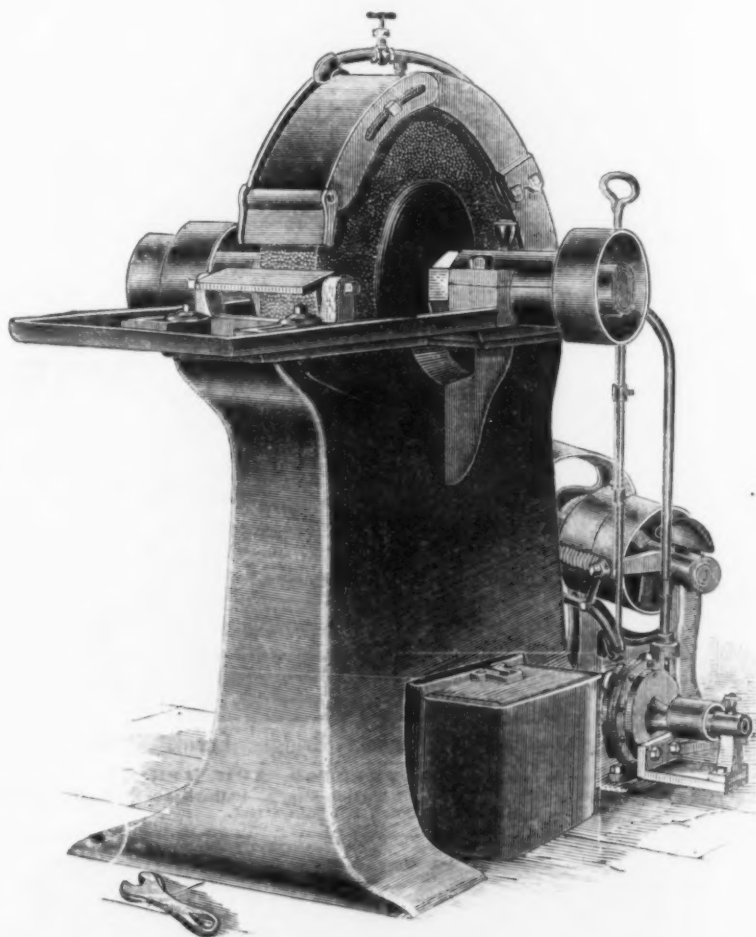
That the torpedoes cannot be destroyed by artillery fire from an enemy's ship has been thoroughly proved. The floats have been anchored in front of a fort and kept under a concentrated fire for hours, and still, riddled as they were, they floated and were ready for immediate service.

Steel Ores of the South.

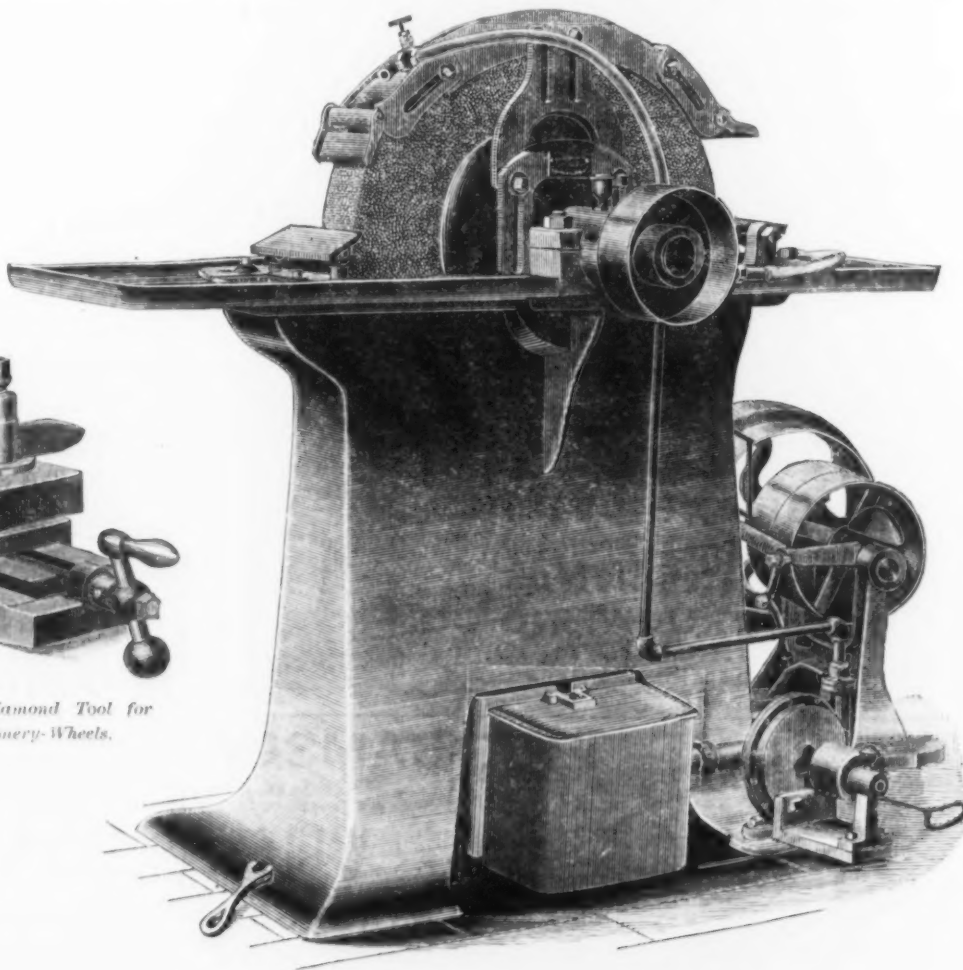
The Southern furnaces have never taken any position in the market as to the production of Bessemer pig metal. With one exception no furnace south of Virginia makes any pig that can be claimed to be of that class. This is manifestly a great disadvantage. The fact is that, with her immense wealth of iron ores, the quality which will make Bessemer pig is very scarce and

tain, and has a considerable amount of titanium. The size of the vein, its evident quantity and possible cheapness of mining, as well as short distance from the railroad, cause this ore to merit more thorough examination than it has received.

Several years ago a company built a narrow-gauge road from the line of the Virginia Midland Railroad, in Pittsylvania County, to the magnetic iron-ore beds west of the road and near the line of Henry County. It was operated for some time and the ore shipped to Harrisburg. Of the present status I am not informed. It is probably the same ore as the Dan River, N. C., magnetites. The Dan River magnetites are not accessible to transportation, and have not been thoroughly explored. In the same line southwest are beds in Rutherford County, and a little west a very continuous vein shows in McDowell County. The latter ores all show to some extent in South Carolina, but no body of sufficient size to warrant large operations has been found. West of the Blue Ridge, in North Carolina, veins of magnetite have been found at various points and some traced over large areas. Some of these veins contain titanium and others are not only free from that substance, but also free from phosphorus. Of the latter the Cranberry vein is the only one on which any development has



Slide-Rest and Diamond Tool for Tracing Up Emery-Wheels.



NEW EMERY-WHEEL TOOL GRINDERS, BUILT BY THE SPRINGFIELD GLUE AND EMERY-WHEEL COMPANY, SPRINGFIELD, MASS.

sharper cutting grit. A machinist averages perhaps half an hour daily at a grindstone, and in a shop of 20 men 10 hours per day are consumed sharpening tools, which at 20 cents per hour amounts to about \$600 per year. This emery-wheel tool grinder, it is claimed, will do the same work in less than half the time, at a saving of over \$300 per year—more than enough to pay for the machine the first year, even if the grindstones cost nothing. The emery-wheel in this machine is surrounded by a hood, except where the grinding is done, which prevents the water flying off, even at high speed, and is adjustable to the wheel as it wears away. The front section is provided with a pocket, with holes through it, to distribute the water over the face of the wheel as it leaves the pipe. This pocket, being open, is easily cleaned of any dust or rust that gathers in the holes. An iron tank is placed under the wheel to receive the water coming from it and to catch the waste ground off. The latter settles to the bottom out of the way and can be easily carried away from time to time. This is an important feature. A second tank is placed by the side of this as an overflow tank, to which a centrifugal pump is connected by a pipe. The water is comparatively clean and is used over and over. The flow on the wheel is controlled by a valve to the desired amount. Four sizes of each style are manufactured, each using steel spindles from 1½ to 2½ inches in diameter, with frame proportioned to the size of emery-wheel used, as follows: 30 x 4 inches, 26 x 4 inches, 20 x 3 inches and 14 x 2½ inches. The small engraving represents a slide-rest and diamond tool made by the company for turning up emery-wheels. It is shown so clearly as to require no description.

The first of three steamers now building for the North German Lloyd Line (New York and Southampton and Bremen) was launched

end of it. The moving object would be a Sims torpedo. It could chase the ship for 2 miles at the rate of 11 or 12 miles an hour, could dive under spars, cut through ropes, wheel around in a circle of less than 200 feet, dart off at any angle and move, to an inch, just as a well-protected operator on shore would by simply working an electric instrument. At the proper moment the operator could either explode the 400 pounds of dynamite or allow the charge to be exploded by contact with the sides of the vessel, just as he pleased.

The Government has bought and received five of these formidable engines of war and has them stored at Willet's Point, ready for instant service. The inventor, Mr. Sims, is building five more of the huge fishlike torpedoes under a contract with the War Department, and there is an unexpended appropriation for still seven more, which have been ordered. It is thought that 200 of these torpedoes will be sufficient to defend the coast against hostile fleets. General Abbott has asked Mr. Sims for an estimate as to the cost of 100, so that it can fairly be settled that the problem of torpedo warfare has been solved sufficiently to resist any known means of attack, the presence of long-range rifled guns being, of course, a necessary auxiliary. So great has been the secrecy maintained by the inventor that no persons have been allowed to enter the Edison Machine Works, where they are made, but Government officers and confidential persons employed in the manufacture. The torpedo is a cylindrical hull of copper, ½ inch thick. It is 28 feet long and 21 inches in diameter, and is made in four parts or sections, which are put together by means of lock joints. This copper hull is supported at a distance of about 5 feet under the water by a comparatively indestructible float, which is also made of copper, and is filled with packed cotton as a means of buoyancy.

no single section weighs more than 800 pounds. Copper and brass are used almost exclusively, and this does away with the faults which steel torpedoes presented to the English Admiralty.

But the great feature of the torpedo which marks it out from all others is the fact that it is propelled, steered and exploded by electricity. All other moving torpedoes contain in themselves the means of motion. As the space is small the power is soon exhausted. Then the torpedo-boat is useless for further maneuvering, although so long as the power lasts it can be steered from the shore by an attached cable. In the Sims torpedo, however, the power is generated by a dynamo-electric machine on shore, and a continuous current of power can be kept up as long as is desired. This dynamo machine may be kept in the heart of the city if necessary, and the electricity conveyed to the shore by an underground wire, or the dynamo may be in a fort or on board of a war vessel. In fact, all men-of-war carry dynamo machines now.

In the bow of the submerged torpedo is placed a charge of 400 pounds of dynamite, which occupies the whole front section. The second section is an air-tight chamber. In the third section are coiled 2 miles of cable, weighing 700 pounds to the mile. It is played out as the torpedo flashes through the water, and thus the propeller is not compelled to do the work of dragging a cable along the bed of the ocean or harbor. One end of the cable is connected with the propelling and steering apparatus in the fourth section of the hull, while the other end of the cable is connected on shore with the dynamo that furnishes the power, as well as with the key-board of the operator. Inside of this cable are two wires—one for steering and the other for propelling. In the last section of the torpedo are two powerful magnets which hold the rudder in the center when the hull is going on a straight

confined to small areas. Even in Virginia that furnace which can claim to make at any time a specialty of Bessemer pig derives most of its ore of that class from North Carolina. Throughout the Alleghany ranges of mountains from Maryland to Middle Alabama numerous veins of ore have been found which gave promise of furnishing a supply for the manufacture of Bessemer pig. Either exploration has proven most of these too small in quantity or analysis has shown that they were not sufficiently pure. There has been but one notable exception so far. What future exploration may develop it is impossible to say. A great area of azoic rocks yet unexplored in the States of Virginia, North Carolina, South Carolina, Georgia and Alabama is comparatively unknown. In North Carolina the width of these rocks is greater than in any of the Atlantic States, and there is a series of belts of such ore in that formation from a point a little east of the Wilmington and Weldon Railroad to the extreme western corner of the State in Cherokee County. The first of these is found on the Cape Fear River, in Harnett County, and upon its supposed immense quantity great hopes were once had of future industrial development. It was pronounced to be the rival, if not the superior, of the Missouri Iron Mountain. The great cap of ore proved to be only an overflow from a very small vein, and a supply for one small charcoal furnace is now obtained with difficulty. There is a similar appearance in a southwest line which has never been explored in the County of Montgomery, but it is some distance from any railroad. In Randolph County several veins occur of apparently excellent ore, but also distant from any railroad. One of the most interesting series of spathic ores occurs near the line of the Charlotte and Atlanta Railroad, in both North and South Carolina. No sufficient exploration of them has been made to determine quantity. The largest vein occurs in Crowden's Moun-

been attempted. It is of great width and length and extends into Tennessee.

In Georgia veins of magnetite have been found, but none of such apparent extent as to warrant the outlay of large sums of money. It is possible that in the northeast part of this State, as yet much unknown, such veins may yet be found. Alabama has a great area of very pure limonites, but none which in themselves would make Bessemer pig. Several veins of magnetites and specular ores have been found, but the former have too much titanium and the latter are too silicious. A singular body of this ore occurs in Paulding County, near the Georgia line. It is a large vein of very silicious ore, and near by is a narrow one of very pure micaceous specular, really of extraordinary purity. The large area of limonites in the western part of Middle Tennessee, called the "Western Iron Belt," does not afford any quantity of Bessemer ore, though specimens very low in phosphorus have been obtained. In East Tennessee the Cranberry bed comes into the southern end of Carter County, and there is evidence that an immense amount of ore can be obtained therefrom. Developments now being made prove the continuity of the vein, and at least of recurrent masses like that developed at Cranberry. It is not only possible, but probable, that careful examination will find a similar ore in counties further southwest, where the metamorphic rocks exist. A very promising locality only slightly examined by me is in Blount County. In the northern end of Carter County, and in the adjoining part of Sullivan and Johnson, a very peculiar hematite ore exists, which by Professor McCreath's analysis contains only from 0.02 to 0.03 of phosphorus. This ore occurs at various points in the counties named, in lenticular veins, just at or near the junction of the Potsdam sandstone and the lower silurian dolomite. Some

(Continued on page 5.)

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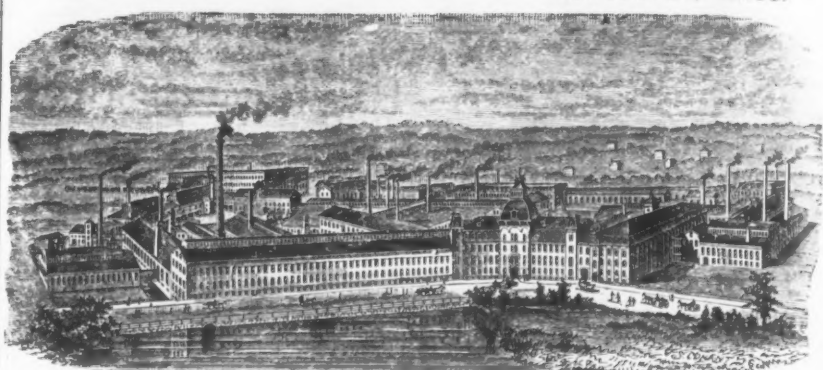
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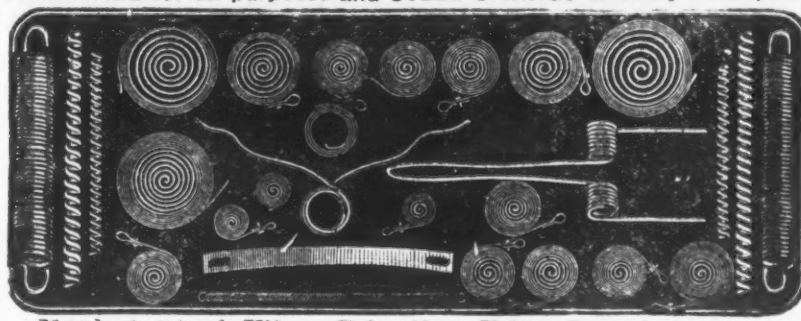
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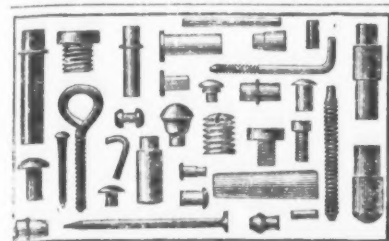
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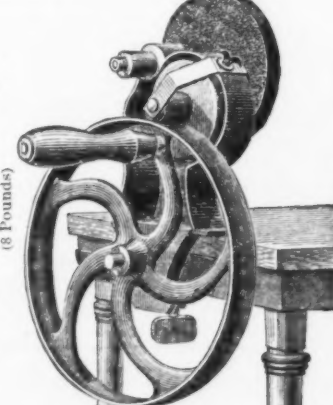
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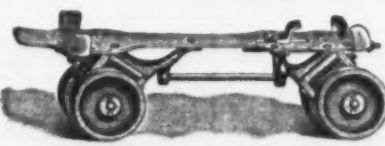
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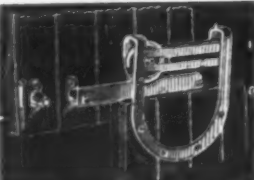


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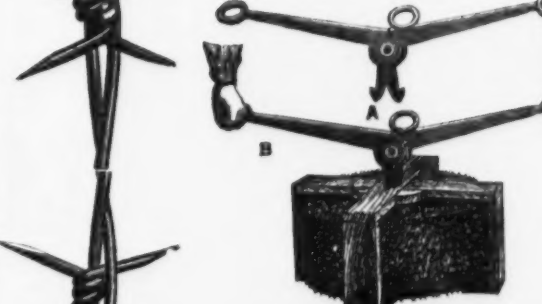
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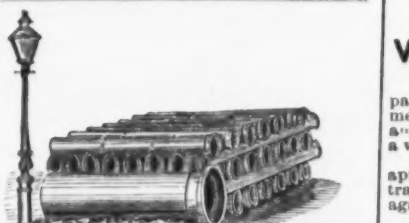
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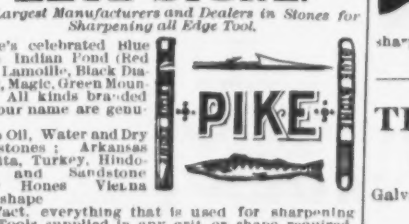
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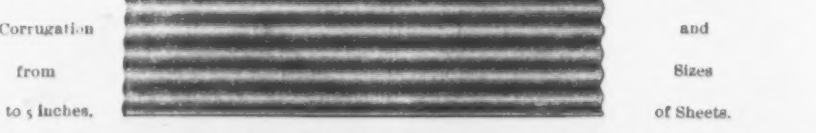
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(Concluded from page 1.)

of the beds seem to be of great size, and their persistency makes them deserve more special exploration. A large quantity of it is on the lands of the Knoxville Car Wheel Co., but no effort has ever been made to use it in their furnaces. Unfortunately it is at no point near a railroad, and the largest bodies are fully 15 to 20 miles distant. Professor McCraith found the limonites of the Cripple Creek (Va.) region very free from phosphorus, but not sufficiently so to make Bessemer pig when used alone. The same ores are found in a southwest line in Carter, Johnson, Washington and Monroe counties, in Tennessee. A very noted locality is at Embreeville, in Washington County; this ore contains as low as 0.06 of phosphorus. For making Bessemer pig they are valuable as a mixture, as also are many limonites in Georgia and Alabama. Near what is called the "great marble belt" all through East Tennessee is found a peculiar hematite ore of great richness and purity, but the quantity is small, the only considerable body having been found near Sweet-water, from whence about 1000 tons were taken and used as flux by the Roane Iron Co. It is a singular fact that the long and wide area of Potsdam sandstones in Tennessee, Georgia and Alabama do not afford any large bodies of hematite ore. A very promising locality was opened by the Roane Iron Co. near Cartersville, Ga., and about 5000 tons taken therefrom. Thin veins with very handsome ore occur at other points, but no great quantity has yet been discovered. The pig made from the above by the Roane Iron Co. was of good quality. In examination of some land on Frog Mountain, in Polk County, for a supposed copper mine I found outcrops indicating a large vein of this ore, but it is fully 35 miles from any railroad. It is plain that the only great body of steel-making ore in any of the Southern States east of the Mississippi yet discovered and at all near transportation is in Mitchell County, N. C., and Carter County, Tenn., on what may be termed the Cranberry series of veins. Its freedom from phosphorus, great quantity, ease of mining and nearness to a railroad make it a very powerful factor in the future production of pig for Bessemer steel, and hence a future article will give a special description of the great mine now worked and of others possible in the future.

North Carolina Coal Fields.

The coal deposits of North Carolina have recently been examined by Dr. H. M. Chance, under the direction of the North Carolina State Board of Agriculture, with the view of determining their commercial value. Mr. I. C. Russell, in a recent issue of *Science*, summarizes the contents of Dr. Chance's report as follows:

There are two isolated triassic areas in North Carolina in which coal has been mined, one on Deep River and the other on Dan River. Dr. Chance's explorations in the Deep River coal field consisted mainly in a re-examination of the coal outcrop, which follows the west border of the area and passes through Farmville, Gulf and Carbon-ton. The various sections obtained show that in general there are two workable coal seams in this field, as was proven long ago in the Egypt shaft and at several mines along the coal outcrop. The upper seam averages 2.5 to 3 feet and the lower 2 feet in thickness. In the Egypt shaft the upper coal measured 4 feet and the lower 1 foot 10 inches; 27 feet below the lowest of these workable seams, another, 1 foot thick, was penetrated. At Gulf three workable seams outcrop, but their thickness is variable, owing to disturbances due to trap-dikes and faults. The dip of the coal seams is in general S. E. 25-30°. Several new analyses of the coal of this area are presented, some of them being of average samples from large quantities. The coal is bituminous, as is shown by the following average of a large number of analyses: Volatile matter, 30; fixed carbon, 54; ash, 12; sulphur, 3.6 per cent. At times the coal has been altered to a semi-anthracite, and even to a natural coke, by the heat of trap-dikes. The expense of working the coal in seams 2 feet thick is estimated at \$1.50, and in seams 3 feet thick at \$1.20, per ton. In the mines of Tennessee and West Virginia, with which the North Carolina coal comes in competition, mining is carried on at the rate of about 65 cents per ton. Combining these figures with the cost of transportation, it is shown that there would remain a sufficient margin in favor of Deep River coal to command the market in Eastern North Carolina. This is favorable to the development of the Deep River deposits; still the fact that these mines have not been worked for many years is significant.

The Richmond coal field, which is of the same age and of the same general character as the Deep River deposit, but in which coal occurs in much thicker seams, and in general is of better quality, has also been a failure when the mining operations of the whole field are considered. It is evident, therefore, that there must be some sufficient reason why mining in these fields, which are in close proximity to good markets, has not succeeded. Dr. Chance enumerates some of the more obvious difficulties that present themselves in the Deep River area: There are variations in the thickness and quality of the seams, faults, trap-dikes, presence of explosive gas, water, spontaneous combustion and absence of coal from certain areas. Nearly all of these obstacles are probably much more difficult to surmount in these mines than in the great coal fields to the west, with which the North Carolina coal comes in competition. To the present writer, who has recently examined all of the triassic areas south of the Potomac, it appears that the difficulty in the way of economical mining in the various triassic coal fields arises mainly from the structure of the deposits. All of these areas are extensively faulted, and are traversed by an extended system of trap-dikes. Along the faults the coal has been so completely crushed that it is usually of little commercial value. At the same time the continuity of the beds has been broken and their dip disturbed and rendered irregular.

This widespread disturbance renders the expense of working the coal extremely un-

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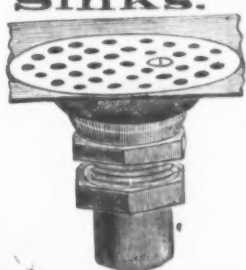
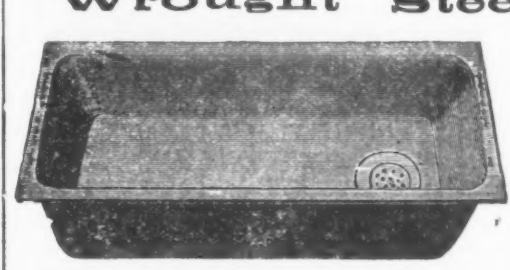
FIG. 120.



FIG. 209.



FIG. 70.

**Wrought Steel Sinks.**

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and which is pronounced by all plumbers the best on the market. It is used with both lead

and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping

out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks

without extra charge.

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are recognized by most competent judges is evident from the fact that leading houses which have been

interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is

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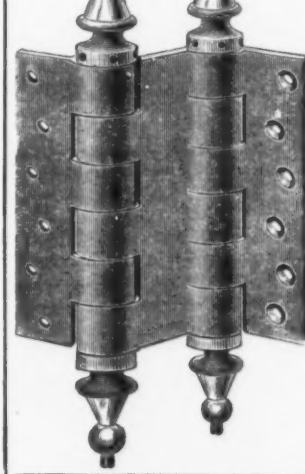
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all interested parties, to our Spiral Spring Hinge, knowing it to be

an effective and durable one, neat in appearance, easy to put on,

and not liable to get out of order. The Springs are made from

wire made expressly for us and for this particular purpose, with

the view of great elasticity, durability and power. They produce

a continuous pressure from the point where the door is wide open

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solid pin in connection with short hollow ones, causing little or

no friction, the whole power of the Spring being exerted in swing-

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Under other kinds are included blister,

cast and puddled steel. The 49,550 tons of

Bessemer steel were manufactured by the

following 15 works: Sandviken, 8,450 tons;

Bangbro, 6,150 tons; Avesta, 4,450 tons; Nyk-

roppa, 4,200 tons; Domnarvjet, 4,000 tons;

Forsbacka, 3,700 tons; Vestanfors, 3,500

tons; Langshyttan, 3,120 tons; Björneborg-

certain, mainly on account of the difficulty of following faulted beds. The numerous trap-dikes that intersect the triassic areas north of the Potomac have caused disturbances which are even more injurious to the coal deposits than the effects of faulting. The dikes are frequently accompanied by a displacement of the beds on either side, and also by an alteration of the adjacent coal. At times the coal in proximity to the dikes has been ruined by the heat; but in some instances, however, a natural coke has been produced which is more valuable than the unaltered coal. Trap dikes more than a few feet thick are so expensive to penetrate that they are practically insurmountable obstacles when met with in coal mines. This was the case in certain mines formerly worked at Gulf. Again, the trap sometimes penetrates the coal-bearing strata in intrusive sheets, approximately parallel with the planes of bedding, and in these even more troublesome to the coal miner than when it forms vertical dikes.

A study of the numerous mining operations that have been carried on, commonly with failure, in the Richmond coal field, would illustrate the peculiar difficulties to be expected in the Deep River basin. The lack of success in so many mining ventures in the triassic areas south of the Potomac, owing to the disturbances that have affected the coal, proves conclusively that mining should not be undertaken in the triassic coal fields of the South without a careful preliminary examination with a diamond drill of the entire property that it is proposed to work. The quantity, quality and position of the coal should be accurately determined before expensive mining operations are begun. With these precautions it is probable that portions of the Deep River coal field can be developed with profit, but it is safe to predict financial failure for those who begin mining with the expectation of working continuous coal seams in the manner followed in West Virginia and Pennsylvania. The coal deposits on Deep River were also examined by Dr. Chance, who pronounces them to be valueless for commercial purposes.

The Iron and Coal Trades of Sweden.

The following are a few statistics relative to the Swedish iron industry during 1883—the latest issued. During 1883, 596 iron mines were being worked in Sweden, and from 449 of these 870,000 tons of magnetic iron ore were raised. The number of mines under working in 1882 being 450 and the output 875,000 tons, there is a decrease of 5000 tons as compared with the previous year, but the number of mines at work was then 10 more. In addition to the output of magnetic ore some 3500 tons of lake and bog ore were obtained in the Provinces of Jönköping and Kronoberg, as against 2500 tons in 1882. In 1883 there were 6220 people employed in the iron mines, 534 of whom were women and children. In the same year 191 furnaces were in blast in Sweden, producing 415,000 tons of pig iron, of which 8500 tons of castings came direct from the furnace. The greatest number of furnaces was in the Province (län) of Örebro, viz., 50, turning out very nearly 100,000 tons of pig iron, while the largest output of pig iron by one works was 13,500 tons by the Domnarvjet Iron and Steel Works with three furnaces, the production during 24 hours being 15 tons. In 1883 there were 4450 persons employed at the furnaces, against 4100 in 1882. In addition to the 8500 tons of castings returned direct from the furnace there were in 1883 manufactured 16,000 tons of castings by the re-melting of pig iron, the greatest quantity being turned out at the Husavarna Factory, viz., 1200 tons.

For the manufacture of bar iron there were 250 works in operation in Sweden during 1883, with 766 furnaces, turning out 250,000 tons of bars. The largest make was at the following four works: Domnarvjet, 13,000 tons; Uddeholm, 10,000 tons; Sandviken, 8000 tons; Motala, 6500 tons. In addition to the above-mentioned quantity of bar iron produced there were 140,000 tons of blooms drawn into bar iron at mills with proper appliances.

With regard to the steel industry of Sweden, it seems to become one of the most important trades, and this is chiefly owing to the step taken by Swedish shipbuilders of late in deciding that steel is the most economical and most enduring material for constructing steamships. The manufacture of Bessemer steel during 1883, as compared with 1882, will be seen from the two following tables. We ought to explain that the term "Bessemer" covers all steel manufactured on this principle, irrespective of hardness. The tables show the manufacture in the various counties or provinces in the two years:

County (Län)	No. of works.	1882.			
		Bessemer steel, Tons.	Martin steel, Tons.	Other kinds, Tons.	Totals, Tons.
Gefleborg	3	15,340	—	—	15,340
Upsala	2	—	—	408	408
Kopparberg	5	9,980	3,150	150	13,280
Vestmanland	4	3,510	150	536	4,200
Örebro	3	7,081	139	—	7,220
Värmland	9	10,066	6,321	195	16,582
Elfsborg	2	—	—	103	103
Östergötland	1	—	—	5	5
Totals	30	46,416	9,760	1,406	57,582

County (Län)	No. of works.	1883.			
		Bessemer steel, Tons.	Martin steel, Tons.	Other kinds, Tons.	Totals, Tons.
Vestmanland	1	—	—	10	10
Gefleborg	3	15,090	—	—	15,090
Upsala	2	—	—	400	400
Kopparberg	5	12,500	3,300	250	16,050
Vestmanland	4	3,500	1,700	4,300	9,500
Örebro	3	7,450	1,800	—	9,250
Värmland	9	11,100	7,300	—	18,400
Elfsborg	2	—	—	270	270
Totals	30	49,550	16,100	5,130	70,780

In preparing concrete, solidity is the great end to be obtained, and therefore, in view of what we have said as to thin joints, such precautions must be taken as will obviate the occurrence of considerable interstices by which, the work being honeycombed,

shyttan, 3050 tons; Iggesund, 2940 tons; Uddeholmsverken, 2750 tons; Skärnors, 1360 tons; Ulfsyttan, 740 tons; Langban-shyttan, 660 tons, and Borgvikshyttan, 450 tons. These figures show clearly that the steel industry of Sweden has made a great stride. The great advantage in the steel industry must be attributed to the state of shipbuilding in Sweden, which during the last five years seems, so to speak, to have become the shipbuilding yard of the neighboring countries, viz., Norway, Denmark and Russia. The manufacture of steel in Sweden has, as may be seen from the following figures, doubled in the course of four years: 1879, 27,100 tons; 1880, 36,730 tons; 1881, 48,678 tons; 1882, 57,587 tons; 1883, 74,680 tons.

The finished iron and steel industry also shows considerable progress. In 1882 there were 156 works in operation for the manufacture of finished products, which turned out 42,000 tons, and in 1883 the same number of works produced nearly 44,000 tons, an increase since 1881 of 7000 tons. In 1883 there were made 18,000 tons of plates, against 15,000 tons in 1882; 8500 tons of nails, against 7900 tons in 1882; 4500 tons of tools and implements, against 2700 tons in 1882; and 13,000 tons "sundry manufactured articles," against 16,500 tons in 1882. Under the latter heading there are some 3000 tons of fine iron, about 1000 tons of wire, and 400 tons of rails. In 1883 there were 5574 persons employed in the works, against 6376 in 1882. The quantity of manufactured iron and steel goods produced during the quinquennial period was as follows: 1

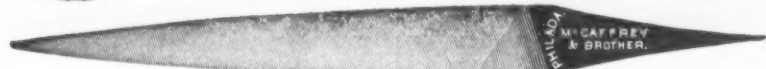
Paris, 1878.

**McCAFFREY & BRO.,**

PENNSYLVANIA FILE WORKS.

Philadelphia, Pa., U. S.

For Superiority.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

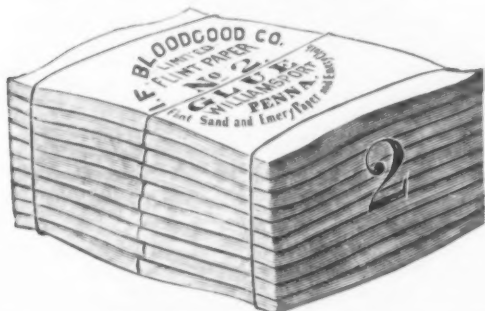
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We strictly guarantee our quality as equal to any make in market.

FOR SALE BY OUR AGENTS,

JOHN H. GRAHAM & CO.,

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AT LOWEST FACTORY PRICES.

LIGHTNING HAY KNIVES. WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 30 pounds weight, suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY

HIRAM HOLT & CO., East Wilton, Franklin Co., Maine.

For sale by the Hardware trade generally.

CAUTION:

We are informed that various parties are infringing upon the widely known Letters Patent granted originally to George F. Weymouth, for an improved Hay Knife.

The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringers of our patent, and we have already commenced one suit, which is nearly ready for hearing, and are about commencing suits against other parties.

All manufacturers are hereby warned of our rights, and the public are cautioned against purchasing any Hay "Saw Knives" which are not of our genuine manufacture.

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MECHANICS'
WRENCHES**

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Swedes and American Iron Tacks of All Kinds.

Having lately withdrawn from the combination, we are at liberty to make such terms and prices as we think expedient. Quality guaranteed the best in the market. Any variation from regular sizes and shapes made to order from samples.

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MANUFACTURER OF

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73 German St.NEW YORK SALESROOM,
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Feather Edge,
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Flat Equaling,
Flat Wood,
Gang Edger,
Ginsaw,
Gulletting,
Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-End),
Handsaw Taper, single-cut,
Handsaw Taper, double-cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
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Baker's
Beveled Edge,
Bread,
Cabinet,
File, Flat and Half-Round,
Flat Shoe,
Flat Wood,
Half-Round Shoe,
Half-Round Wood,
Horse, Plain and Tanged,
Horse Mouth,
Jig,
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Bent Rifflers, Handled,
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FILE CO.,
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TRADE

MARK.

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Warranted Cast Steel.

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FILES, RASPS.

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Specially Adapted for Use on Wire Fence.

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Special Machinery for Grain Elevators, Grain Steam Shovels, &c., contracted for. Car Wheels and Car Castings at lowest rates.

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Send for Circular and Price List No. 15.

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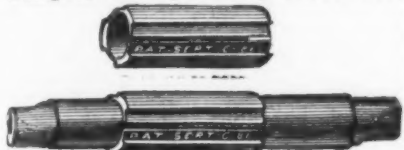
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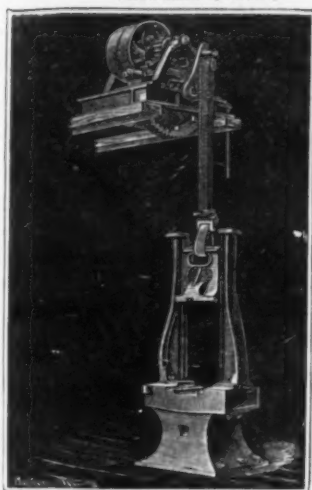
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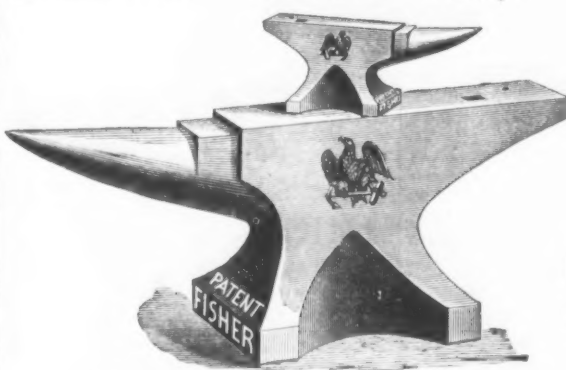
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CYLINDERSof every description,
and other
HYDRAULIC MACHINERY.ESTABLISHED 1843.
MORE THAN 200 DIFFERENT PATTERNS.

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EAGLE and "FISHER" Stamp.**WARRANTED BETTER THAN THE BEST ENGLISH ANVIL**Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly
true, of hardest temper, and never to come off or "settle." Horn of tough untempered
steel, never to break or bend. Only Anvil made in United States fully warranted as
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ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for
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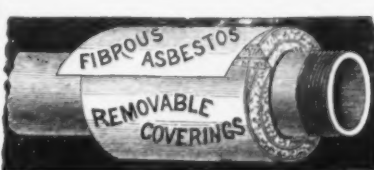
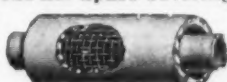
The Hartman Bale Tie.

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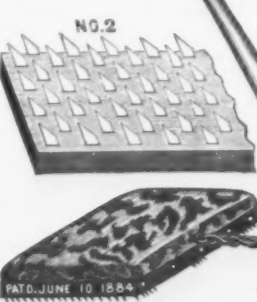
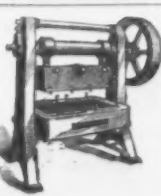
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IMPROVEDNo 45. Adjustable Beading, Rabbit
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PERFECT CARPET STRETCHER1. Represents Stretcher ready for use, also the
Cushioned Knee Rest; Block, 5 x 8 inches.
2. One inch full-size section of convex wire.
The only stretcher that receives the recom-
mendation of the entire trade.
It has over 400 convex steel points, 3-16 inch
long, set in leather, that are inserted into the
carpet, therefore cannot injure it. It is neat,
durable, convenient, and sells on its merits.
It is the only upholstered Stretcher made.
EVERY STRETCHER WARRANTED.
Price, \$1.00. Liberal Discount to Trade.**SHAFFER & LORD, Mfrs., La Porte, Ind.****FERRACUTE MACHINE CO.,**
BRIDGETON, NEW JERSEY, U. S. A.**Presses, Dies AND ALL Sheet Metal Tools.**Send for Illustrated Catalogue with sizes, weights and prices
of 100 different kinds of Presses and Tools forCans, Tinware, Silver and Brass Goods, Locks, Hardware
and other Iron Goods. A new line of Punching Presses just out.

would be rendered weak and liable to col-
lapse. Thus, if we have a pit filled with big
stones we may yet put a quantity of smaller
ones between them without enlarging the
gross bulk, and after that a considerable
quantity of sand may be poured in. Variety
of sizes of stone employed and the conse-
quent need of sand to fill the crevices is of im-
portance from this point of view, as well as
the necessity of its presence to form mortar
with lime to cement the stones together, for
it must be remembered that no effect will be
produced by the lime alone, and practically it
is better to have too much sand than too
little. In the best sample referred to above
it will be seen that the proportions were:
lime, one part; sand, three parts, and stones,
six parts, by measure, the lime forming only
one-tenth of the whole mass; and this has
been found to be better than using a larger
quantity if the proportions of sand and
stones are adhered to. It is essential that
the gravel should be freed, by washing if
necessary, from all impurities, and the sand
should be clean and sharp, for dirt will
make neither mortar nor concrete.

There has been much conflict of opinion as to
the various methods employed in mixing
and using concrete. The system of putting
down the ballast in thinish layers, and
grouting and ramming each layer, is de-
cidedly bad, as the under layer, having
quite set by the time the next is being
rammed, may be cracked by the blows of
the rammer; and, moreover, we have no
guarantee that all the interstices are filled.
The proper course to pursue consists in
thoroughly mixing the lime, previously
ground, with the ballast in a dry state.
Sufficient water is then thrown over it to
effect a perfect mixture. It should be turned
over three or four times with shovels, and
used immediately. It is convenient to em-
ploy two sets of men to carry out these
operations, there being three men in each
set. One man is engaged in fetching the
water, &c., while the other two turn
it over to the second set, who, re-
peating the process, turn it over to the
barrow men, who will immediately wheel
it up to a sufficient height above the
foundation to cause it to be consolidated by
the fall. Among the various materials that
may be employed in the preparation of con-
crete are clay, which may be burnt into
ballast easily and cheaply, and is an ex-
cellent material for concrete; gravel; broken
stone; crushed furnace slag; smiths' clink-
ers; oyster-shells; broken glass or crockery;
and, in fact, almost any description of hard
and durable substance. Where sandstone or
any flat stone is abundant concrete can be
made with that material even cheaper than
with gravel, the stone being broken up by a
suitable disintegrating machine, of which
there are several kinds now in the market.
It is to be observed that angular fragments
of stone will make better work than those of
conchoidal shape, which do not give so good
hold or key for the mortar. A very service-
able concrete may be made of seven measures
of brickfield burrs, seven measures of gravel
stones and one measure of Portland cement.

The Manufacture of Augers.

The principle of the auger now in use all
over the world is said to have been discov-
ered by accident. In 1680 Benjamin Pugh,
an Englishman, while watching some boys
working endeavoring to bore a hole in the
ground with a piece of iron barrel hoop, no-
ticed that after the hole had been sunk
some distance into the earth, and the pli-
able metal of their improvised tool had be-
come heated, it twisted and carried the dirt
up to the surface nicely, and he could not
see why the same principle should not ap-
ply to wood. The invention of the auger
was the result. The screw auger is an Amer-
ican invention, and was invented about 100
years ago by Thomas Garrett, who lived in
the vicinity of Oxford, in Chester County,
Penn., where most of the black augers are
still made. Most of the bright tools are
made in the East, but one of the principal
manufacturers is in Philadelphia. The old-
fashioned post auger is still used in England
and Germany. The single-screw auger is
also an American invention, and was first
discovered by accident by a Philadelphian.
It is the only auger that can be used to any
satisfaction in very hard woods, where the
double-screw augers become clogged.

Although every one is perfectly familiar
with this commonplace tool, but compara-
tively few know the process of its manufac-
ture. In making augers the iron which
forms the main or spiral part is welded into
the steel of which the tip is made before
forging. The bar is then put under ham-
mers and forged into shape. It is then put
into what is called a "wringing machine"
and twisted up in a rough state into the spiral
form, after which it is passed through
"crimpers," giving a uniformity of twist.
The augers are next put through "straight-
eners" and revolved, making them perfectly
straight, when they are ready for putting on
the head, which is the most delicate opera-
tion in their manufacture and requires the
work of a skilled artisan. They are then
subjected to a "grinding-out" process,
which consists of putting them through two
rubber wheels to rough-polish the twist. The
"fitter-up" then takes hold of them and
"lightens" or fits the head; then the filers
file down and sharpen the heads, after which
they pass through the hands of the polishers,
where they are polished and hardened ready
for market.

The expenses incurred by New York mer-
chants in harbor and local transportation
are estimated by a well-known railroad man-
ager at not less than \$25,000,000 per annum,
which tax must be sustained by the purchas-
ers of the goods. In addition there is a
heavy expense incurred after the goods have
reached terminal points upon opposite shores.
One railroad line owns 22 tugs, 38 floats and
46 lighters and barges, used for no other pur-
pose than bringing the merchandise from
the railroad terminals to the city itself. An-
other railroad line owns 8 tugs, 19 floats, 46
lighters and barges, a steam lighter and a
large steamer, all constantly engaged for the
same purpose. The aggregate cost of these
auxiliaries is estimated at over \$600,000 per
annum, which at 4 per cent. represents the
interest on the capital of \$15,000,000.

**Annual Review of the Meta
Market for 1885**

The chief features of the year were, in the
first place, the purely speculative advance in
Tin in London of some £20 per ton, next the
enormous decline in Copper to £38. 10/, and
the sudden rebound in 10 days to £44, but
indifferently upheld afterward; furthermore,
there was the successful formation of a
Spelter syndicate in Europe, and finally the
advance in Lead which characterized the
last months of the year in this market,
induced by actual scarcity, consumption
having outrun production.

Course of Prices at New York—Cents per Pound

	July 1, 1885	Dec. 1, 1885	Dec. 15, 1885	Dec. 23, 1885	Dec. 30, 1885
Lake Copper	24 1/2	18	15	11	11 1/2
Straits Tin	31 1/2	21	18 1/2	10 1/2	20 1/2
Domestic Lead	6 1/2	4 1/2	3 1/2	3 1/2	4 1/2
Spelter	7 1/2	4 1/2	4 1/2	4 1/2	4 1/2
Antimony	13 1/2	12 1/2	11 1/2	10 1/2	9
Coke Tin	39 1/2	35 1/2	35	34 1/2	34 1/2

The year closed with a confident feeling
among the metal trade that 1886 would prove
a prosperous business year.**Copper.**

It will be remembered that toward the
close of 1884 the Lake Superior mining com-
panies made a contract with the manufac-
turers' pool to sell them 12,000,000 lb. of
Copper at the minimum price of 10 1/2¢, if
between the 10th and 25th of the month
preceding delivery during the first five
months over which delivery was to spread
Chili Bars stood on an average £48 in the
London market, adding 1/2¢ per lb. for each
rise of 10/ till £53 was reached, when the
price was to be 11 1/2¢. When the terms of
this contract became known, January opened
very quiet at 11 1/2¢, Chili Bars being worth
in London at the time £48. 17/6. The quiet
state of the market was only interrupted
during a few days when it became known
that the miners of the Anaconda mines had
struck for higher wages, it being appre-
hended at the time that this example might
become contagious at other points where the
companies were known to be under Euro-
pean contracts, but as nothing important
grew out of it the slight temporary advance
to 11 1/2¢ was not sustained. Meanwhile
statistics reached us from England showing
that the import there from Chili in 1884 had
been 31,298 tons Fine, against 27,504 in
1883, and 39,112 in 1882; at Liverpool and
Swansea from this country 17,309, against
9,410 and 7,451; at London from Australia
10,323, against 9,534 and 9,735, and in Eng-
land from Spain 14,077, against 15,017 and
15,673. The combined English and French
import had been 117,404 tons, against 111,-
386 in 1883, and 93,552 in 1882. There had
been shipped from Chili altogether during
the year 43,700 tons, against 41,229 and
43,129. At Valparaiso the 28 ¢ decline in
Copper had been counterbalanced by a 26 ¢
depreciation of the paper money and the
abolition of £1 per ton export duty. It was
furthermore stated that the cost of produc-
tion at Huelva, in Andalusia, was £35. 10/
per ton, but that it was believed the figure
would be slightly higher for 1885. The cost
of Copper production at the Cape of Good
Hope was stated to be £10. Chili Bars
meanwhile improved gradually in the Lon-
don market to £48. 10/ on January 14; on
January 15 and 16 they stood £48. 12 1/2; 17,
£48. 17/6; 19, £49. 5/; 20, £49. 10/; 21,
£49. 5/; they then receded to £47. 7/6 on
the 27th; stood £48. 17/6 on January 28; 29,
£48. 10/; 30, £48. 7/6, and £47. 15/ Janu-
ary 31.

Copper Production in the United States in 1884.

	Pounds.
Lake Superior	60,240,000
Arizona	26,734,745
Montana	40,612,758
New Mexico	59,450
California	876,166
Colorado	2,013,125
Utah	295,526
Wyoming	100,000
Nevada	46,667
Idaho	329,000
Missouri	349,000
Maine and New Hampshire	655,406
Vermont	317,711
Southern States	2,114
Middle States	960,870
Deliveries, &c.	

Total domestic 142,363,190

From imported Pyrites 2,898,754

Grand total 145,261,944

Against 1883 117,151,795

Against 1882 91,646,232

February was, if possible, a still duller
month than January, opening quiet at 11 1/2¢,
while, owing to the decline in Chili Bars the
previous month, manufacturers had only to
pay \$10.50 for what they received in Feb-
ruary. Meanwhile Chili Bars fluctuated in
London as follows: February 2 and 3,
£47. 15/; 5, £48. 6/; 7, £47. 12/6;
9, £47. 17/6; 10, £47. 12/6; 11, £47. 12/6;
12 and 13, £47. 10/; 14, £47. 12/6; 16,
£47. 15/; 17, £47. 10/; 18, £47. 7/6; 19,
£47. 5/; 20, £47. 2/6; 21, £47. 2/6; 23 and
24, £47. 5/; 26 and 27, £47. 2/6, and Feb-
ruary 28, £47. 5/. The course of Chili Bars
in February gave manufacturers their Cop-
per for March at \$10.40. Best Selected had
meanwhile also gradually given way in Lon-
don to £52. Spanish export of Pyrites in
1884: 617,958 tons, against 564,565 in 1883,
and 571,441 in 1882; of Ingot Copper, 19,340
tons, against 23,076 and 22,695. February
closed with Lake Copper at 11 1/2¢.

March was again an excessively dull
month. From England news reached us
that the New Quebrada Co., of Venezuela,
which produced 3673 tons of Copper in 1884,
had made a contract for their product for five
years, the price being based on Chili Bars.
The announcement was made on March 13
that Messrs. Pope, Cole & Co., of Baltimore,
had made an assignment and that their liab-
ilities were placed at \$1,000,000. It was
supposed that their embarrassment had
come through their connection with the Old
Dominion Copper Co., of Arizona. Toward
the close of March it was reported that the
Anaconda Co. had made another sale abroad
of 6000 tons of Matte, (about 60 ¢), making
something like 7,000,000 lb. of Copper,
deliveries to run over five months. The
price was not stated, but it was said to be
based on Chili Bars, and not on Best Se-
lected, as was done in a previous sale. The
course of Chili Bars in London during March
was as follows: March 2 and 3, £47. 7/6;
4, £47. 5/; 5, £47. 6/ and 7, £40. 17/6; 9,
£40. 15/; 10, £40. 5/ @ £40. 10/; 11, £40.

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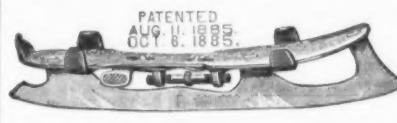
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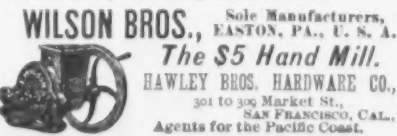
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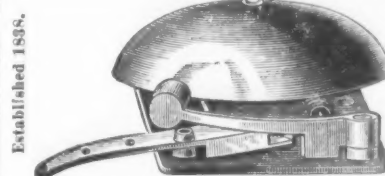
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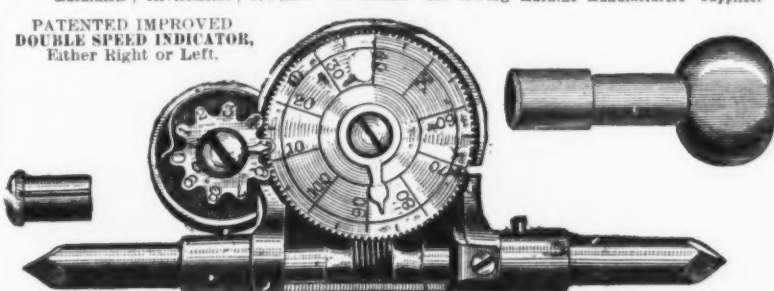
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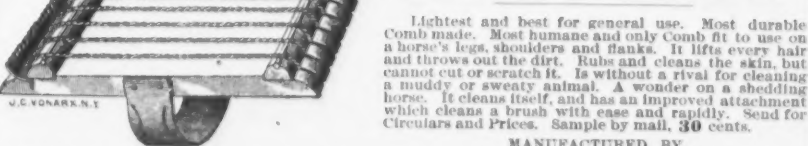
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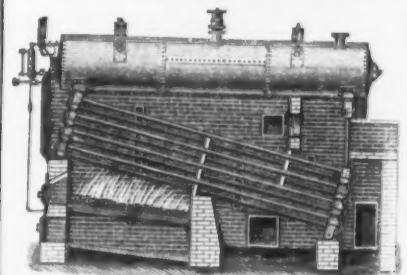
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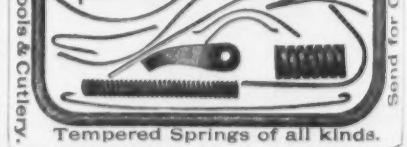
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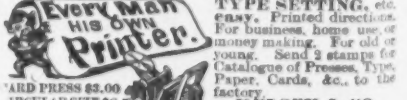
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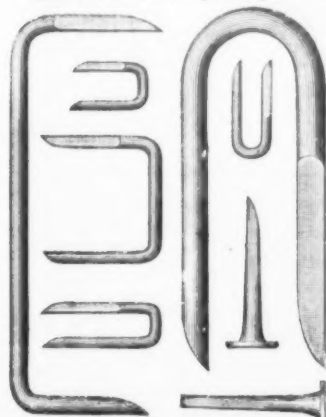


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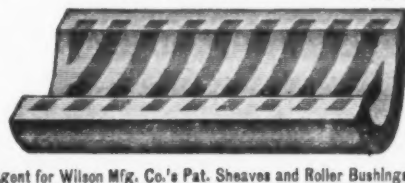
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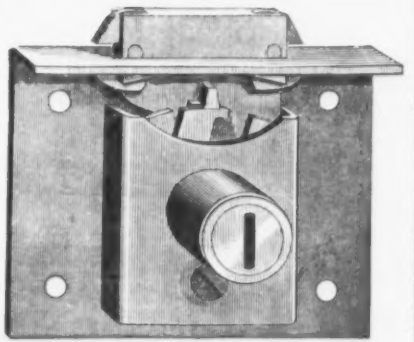
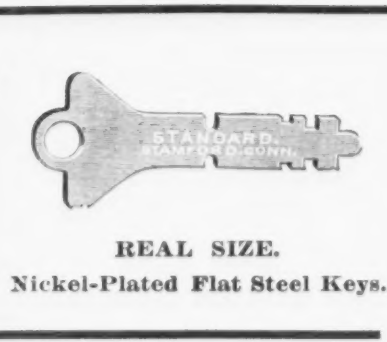
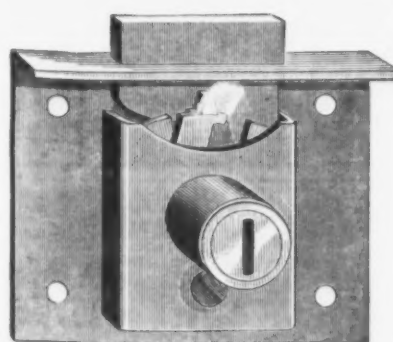
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In April more favorable views began to be entertained on this side, available Copper becoming scarcer at this point and production evidently being somewhat on the decrease in various quarters out West. As for Europe it was insisted that upon the opening of navigation in Baltic ports Russia would as usual appear as a purchaser of between 10,000 and 15,000 tons of Copper in Central and Western Europe. In Australia officers of the Wallaroo Co., announcing a general reduction of wages and expenses at their mines, stated that their company had been running without profit for the past nine years, and that the company must largely reduce cost or stop altogether. Many other mines in the Wallaroo district were also stated to be closing. From Lake Superior it was reported that 11 of the smaller mines, producing together 11,500,000 lb of Copper, had closed or were about to close. Simultaneously the Betts Cove Mine, in Newfoundland, closed on account of the low price of Copper. A better general local demand springing up at New York in all the month of April, the price recovered to 11 1/2¢, at which it closed. Chili Bars opened on April 1 and 2 at £45. 5/ or £45. 10/, receded to £45. 7/6, and stayed there till April 8, when they gave way to £45. 2/6 and to £44. 2/6 the next day, recovering to £44. 10/ April 11, then receding to £44. 2/6 on the 13th, to £44 on the 14th, and were £44. 2/6 again on the 14th and 16th; £44. 7/6 the 18th and 20th, and £43. 17/6 the 21st and 22d; April 23, £43. 15/; 24th to 27th, £44; 28th, £43. 7/6, and April 29, £43. 12/6, closing the month at £43. 2/6. Best Selected following suit, giving way to £43. To some extent the London market was influenced in April by the threatening aspect of the Afghanistan frontier disputes.

When, therefore, in May this scare had subsided, Chili Bars reacted readily, and for the time being recovered a couple of pounds. As, however, at the same time the Copper statistics became more and more unfavorable, the advance could not be sustained. Here, too, opinion again turned against the metal, and from 11 1/2¢ the price declined to \$10.40. Some statisticians on this side estimated that we should produce 150,000,000 lb in all likelihood; that 64,000,000 lb were contracted to go to Europe, and that, with a home consumption of 64,000,000 lb, there would remain a surplus of 6,000,000 lb still to be exported in order to terminate the year with a stock equal to the one at its beginning. Several manufacturers availed themselves of the lull and made a contract for delivery in June, July and August of 10,000,000 lb with the Calumet and Hecla Co. at 11 1/2¢. Import into Liverpool and Swansea from this country during the first four months, 7231 tons, against 4015 in 1884; 1403 in 1883, and 100 tons in 1882. Export of Pyrites from Spain during the first two months, 123,149 tons, against 97,569 in 1884, and 101,061 in 1883; of Ingot Copper, 3288 tons, against 2409 in 1884, and 4263 in 1883. The Rio Tinto Co. reported that the Copper contents in Pyrites had steadily improved, being 2.805 % in 1882; 2.956 in 1883, and 3.234 in 1884, and that the contracts made to deliver Pyrites reached all the way into 1889; that there will be delivered 400,000 tons annually up to 1888. They added that the water reservoir insured ample production for 1885. The Parrot Silver and Copper Co., of Butte, Mont., completed their arrangements with Messrs. E. Balbach & Son, of Newark, for the working of their Blister into Electrolytic Copper, the quantity to be produced being 300,000 lb of this grade, quoted at the time \$11.20 at \$11.40. The course of Chili Bars in London in May was as follows: May 1, £43. 5/; 2, £43. 4/; 3, £43. 10/; 5, £43. 15/; 6, £44. 7/6; 7, £45. 8/; £44. 15/; 9, £44. 12/6; 11, £44. 15/; 12, £45. 13/; £45. 15/; 14, £45. 10/; 15, £44. 15/; 16, £44. 17/6; 18, £44. 12/6; 19, £44. 7/6; 20, £44. 7/6; 21, £44. 7/6; 22, £44. 5/; 23, £44. 5/; 24-26, £44. 2/6 or £43. 17/6; 27, £43. 5/; 28, £43. 10/; 29, £44. 2/6; 30, £44. 2/6. Messrs. Henry R. Merton & Co., London, estimated the world's Copper production in 1884 at 208,313 tons of 2240 lb, against 196,056 in 1883; 174,653 in 1882; 159,711 in 1881; 151,057 in 1880 and 149,156 in 1879. Germany's production was 18,750 tons in 1884, against 17,836 in 1883; the import, 15,145, against 12,965, and the export 13,337, against 11,676.

Opening at 11 1/2¢, the metal displayed little activity in June, people here becoming convinced that there would be no necessity of shipping American Copper this way from Europe; that, on the contrary, the supply at our disposal would suffice to meet the moderate demand, and that, indeed, the condition of trade on this side did not warrant a higher price than 11 1/2¢, to which Lake Copper receded during the month. In Europe there were during a few days apprehensions that the cholera might invade the Rio Tinto region, but these fears were promptly dispelled. During the four months there had, meanwhile, been shipped from this country to Europe some 26,000,000 lb of Fine Copper. Later on it was shown that during the first five months Liverpool and Swansea alone received from here 10,762 tons, against 5198 in 1884; 1746 in 1883, and 114 in 1882. Spanish export of Pyrites during the first quarter had been 206,269 tons, against 158,795 in 1884, and 148,059 in 1883; of Ingot Copper it was 5707, against 3365 and 5935. The Calumet and Hecla increased its output to something like 4,000,000 lb per month. The Anaconda had 18 furnaces going, and it was also proposed to increase the number of its calcining furnaces, so as to be able to keep all its smelting furnaces running steadily. In the meantime the oscillations in Chili Bars in London had been as follows: June 1 and 2, £45. 10/; 3, £45. 4/; £45. 2/6; 5, £45. 10/; 6, £44. 7/6; 7, £45. 7/6; 9, £44. 15/; 10, £44. 12/6; 11 and 12, £44. 10/; 13 and 14, £44. 15/; 16, £44. 10/; 17 and 18, £44. 12/6; 19 and 20, £44. 10/; 22, £44. 7/6; 23 and 24, £44. 5/; 25, £44. 2/6; 26, £44. 5/; 27, £44. 15/; 29, £44. 12/6, and June 30, £44. 7/6.

A rather better feeling obtained in our market in July, despite the otherwise dull state of affairs induced by the warm weather. A reaction set in among consumers against the use of inferior Montana Copper, and the return to better qualities caused a recovery from 11 1/2¢ to 11 1/2¢ during the month. Among occurrences during July there was the announcement that the combination shaft of the Tamarack Co. had reached the great Calumet and Hecla Ore bed at a depth of 2260 feet, but as the supply thence, perhaps 35,000,000 lb annually, would not begin to appear in our markets to any appreciable extent for a twelve-month yet, the news had no immediate bearing on them. Meanwhile the Central Mine and Atlantic were both increasing their output to prospectively 5,600,000 lb per annum together. While this was the case the Arizona mines were struggling hard for existence, causing the Anaconda, too, it was stated, to return to the minimum required by its contracts. Mr. William Keyser, of Baltimore, purchased the Baltimore Copper Works and assets of Messrs. Pope, Cole & Co. The Bell Mine, of Montana, was attached and in the sheriff's hands for debts; its annual production had been 4,000,000 lb. Chili Bars ranged in London as follows: July 1, £44. 12/6; 2, £44. 10/; 3, £44. 7/6; 6 and 7, £44. 5/; 8, £44. 9/6; 15, £44. 2/6; 16 and 17, £44. 18/6; 22, £43. 15/; 23, £43. 17/6; 24, £44. 5/; 25 to 28, £44. 2/6; 29, £43. 17/6; 30, £43. 15/; and July 31, £43. 12/6. In August our market was dull and unsettled pending a renewal of contract between the Calumet and Hecla and our manufacturers for the last four months of the year. Opening at 11 1/2¢, the price declined to 11 1/2¢ at the close. Official statistics showed that during the fiscal year ended June 30 the net Copper export had been 60,671,516 lb, against 14,233,321 in 1884, and of Ore and Matte, 41,615 tons, against 19,307. During the first seven months of the calendar year English net importation of Fine Copper had exceeded the corresponding period of the previous year some 1000 tons. The Anaconda was reported at the time to be running some 15 furnaces, though roasting as many tons as before, and was said to be working on the 1000-foot level. The Parrot Co. were showing full blast and sinking to the 430-foot level, the Ore above the 330-foot level being mostly extracted. Clark's Colusa, it was stated, had Ore for a few months, and would then have to explore. Official returns were received from the Calumet and Hecla of actual amounts smelted at the mine during the fiscal years ended April 30, being 42,556,154 lb for 1881-85, against 35,414,007 the previous year; 31,428,258 the preceding one, and 32,189,985 the one before. The actual Chilean export of Fine in 1884 was shown to have been 96,942,720 lb, against 90,800,600 in 1883. It was stated at the time that the Tamarack would begin to run two stamps in October, crushing 350 tons of Ore per diem, or 30,000 lb ingots; that the Oseola would start three stamps in October-November, but that the Old Dominion would not be able to smelt Ore for some time yet. Import of American Copper into Liverpool and Swansea during the first seven months, 14,553 tons fine, against 7846 in 1884; 3948 in 1883, and 301 in 1882. Deliveries in England and France during a twelvemonth, 104,768 tons, against 107,616 and 85,593 in 1884 and 1883 respectively. Export of Ingot Copper from Spain during the first four months, 9402 tons, against 5745 and 7763; of Pyrites, 278,152, against 213,257 and 213,369. Chilean exports and charters, seven months, 27,407 tons Fine, against 27,928, 26,963, 27,112 and 23,004 in 1884-81, respectively. Course of Chili Bars in London in August: 1 to 5, £43. 12/6; 6, £43. 10/; 7, £43. 7/6; 8 and 10, £43. 5/; 11-13, £43. 7/6; 14, £43. 15/; 17, £43. 10/; 19, £43. 12/6; 20-25, £43. 5/; 26-28, £42. 17/6; 29, £42. 10/; 31, £42. 12/6.

Early in September it transpired that the contract with manufacturers alluded to before had been made for 9,000,000 lb at 11¢, our market thereupon dropping into a state of apathy at 11¢ at 11 1/2¢, within which range it ruled during the month. It was reported that the French Co., in Lower California, would ere long become a heavy producer; that they were building eight furnaces, but that their supply of rich Ore was only about sufficient for one 30-ton furnace, and that for the time being their low-grade Ores would scarcely pay to work at prevailing prices. Accounts from Montana and Arizona were of a discouraging nature as to the profitable character of production. Spanish export the first half-year: Pyrites, 416,874 tons, against 325,325 and 307,414; of Ingot Copper, 13,613, against 7530 and 10,877. Domestic export of the first seven months, 21,680 tons, against 13,582; Ingots, 23,332,586 lb, against 7,510,595, against an import thereof of 2,457,029, against 1,678,467. Course of Chili Bars: September 1-3, £42. 5/; 4, £42. 15/; 5-7, £43. 8/; £42. 17/6; 9, £42. 12/6; 10, £42. 7/6; 11, £42. 5/; 12, £42. 14/; £41. 17/6; 15, £41. 15/; 16, £41. 17/6; 17, £41. 12/6; 18, £41. 10/; 19, £41. 7/6; 21, £41. 10/; 22-24, £40. 17/6; 25, £40. 15/; 26, £40. 7/6; 28, £40. 5/; 29, £40. 12/6; 30, £40. 12/6.

October was devoid of any particular features and with little strength and animation during the month, and the price gave way from 11 1/2¢ to 11¢ at its close, but Arizona and other desirable brands not Lake were in tolerably good request. There was a rumor that a French syndicate had been trying in vain to float the Lower California Copper mines at 12,000,000 francs. It was announced that Messrs. Phelps, Dodge & Co. had obtained control of the Copper Queen Consolidated Co., and that the Parrot had started up their new refinery at Bridgeport, Conn. The Rio Tinto Co. declared a dividend for the first six months of the year at the rate of 6 % per annum, against 8 % for the whole of 1884, and Mason & Barry, Limited, of 4 %, against 8 %. The duty on Ore was raised twenty-five-fold in Russia, in order to put a stop to certain fraudulent importations. Russian production so far does not exceed 4000 tons annually. Export of Copper from this country during the first eight months, 26,133,992 lb, against 10,395,168 in 1884; of Ore, 24,854 tons, against 21,439; import, 2,992,558 lb, against 1,533,909. Import of American Copper into Liv-

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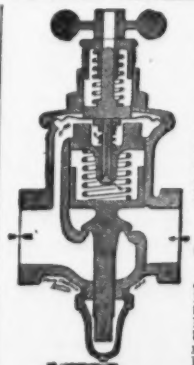
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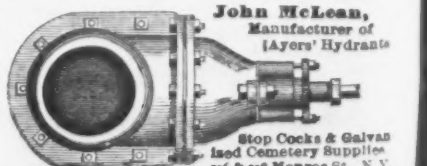
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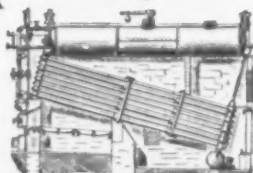


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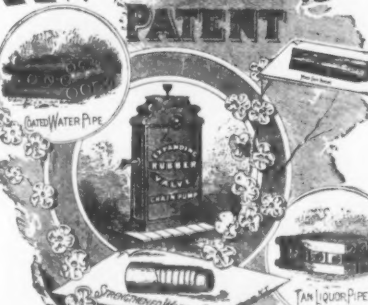
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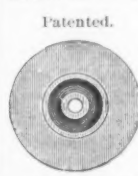
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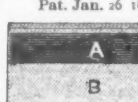
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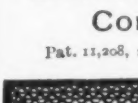
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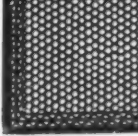
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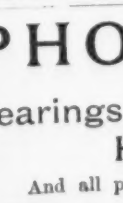
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pool and Swansea the first nine months, 18,742 tons Fine, against 12,752 in 1884; 6006 in 1883, and 521 in 1882. Deliveries in England and France during a twelve-month, 99,314, against 109,310 and 88,929. Chilean charters, 40,650, against 41,300 and 42,450. Course of Chili Bars: October 1, £40. 10/; 2, £40. 12/6; 3, £40. 5/; 5 and 6, £40. 2/6; 7-9, £39. 5/; 10, £39. 7/6; 12, £39. 17/6; 13, £39. 15/; 14-16, £39. 7/6; 17, £39. 12/6; 21, £39. 15/; 22-29, £39. 2/6; 30 and 31, £39. 5/ @ £39. 7/6. Best Selected, £45.

November was a memorable month on account of the low price of £38. 10/ to which Chili Bars declined in London on the 11th, though but for a moment. The market here was not appreciably affected by the London panic while it lasted, its causes not being fully understood at the time. When later on news arrived by mail, it was ascertained that the whole movement was chiefly due to speculative maneuvers in Rio Tinto shares, leading to a momentary attack on Bars. On the same day the lowest price was reached, a contract was concluded in England for 5000 tons of Anaconda Matte, representing about 5000 tons of Fine Copper, or shipments at the rate of 2000 tons monthly from the Anaconda from September 1 to December 31, on the basis of Best Selected at the time of delivery in Liverpool. The market here developed during November more activity and strength as the panic in England spent itself, and from 10 3/4¢ we recovered to 11 1/4¢. The ruling in London had meanwhile been as follows: November 2 and 3, £39. 15/; 4, £39. 7/6; 5 and 6, £39. 5/; 7, £39. 2/6; 9, £39. 10/; 10 and 11, £38. 17/6 @ £38. 10/; 12, £39. 2/6; 13, £39. 17/6; 14, £40. 2/6; 16, £40. 15/6; 17, £41. 18/; £42. 10/; 19, £43. 15/; 20, £43. 10/; 21, £43. 23. £41. 15/; 24, £41. 17/6; 25, £42. 26, £42. 5/; 27 and 28, £43. 5/; 30, £42. 12/6. During the panic Best Selected dropped to £44. 10/. From the interim report of the directors it appears that the Rio Tinto Co.'s production in 1885 was expected to exceed that of 1884 by 5000 tons Fine. It was reported that the Oseola would begin running one head of Bail stamps (150 tons per diem) on Tamarack Ore about December 15, and a second head of stamps before January 1, which would add 500,000 lb per month to the Lake supply, beginning with 1886, until the company get their new mill running; it was added that two stamps would be run on Oseola Ore. Domestic export of Ingot Copper, first 10 months, 32,900,869 lb, against 18,523,961 in 1884. During the same time the import of American Copper into Liverpool and Swansea was 20,986 tons, against 14,645 in 1884; 6952 in 1883, and 586 in 1882. Visible supply in England and France, November 1, 56,547 tons, against 41,760 in 1884, and 46,833 in 1883.

Copper opened in December at 11 1/4¢. The import of American Copper into Liverpool and Swansea from January 1 to November 15 had been 21,986 tons Fine, against 15,201 in 1884 and 8360 in 1883. The course of Chili Bars during the last month of the year was as follows: December 1, £42. 5/; 2, £42. 7/6; 3, £42; 4, 5 and 7, £41. 15/; 8, £41; 9, £40. 7/6; 10, £40. 10/; 11 and 12, £40. 12/6; 14, £41. 10/; 15, £41. 2/6; 16, £41. 15/; 17, £40. 7/6; 18, £40. 17/6; 19, £40. 15/; 21, £41; 22, £41. 12/6; 23, £40. 15/; 24, £40. 17/6. Best Selected declined from £46 to £45. 10/. Visible supply in England and France December 1, 53,984 tons, against 43,518 in 1884 and 47,842 in 1883. Deliveries during 12 months, 103,085, against 108,607 and 94,476. There was in December a probability that one of the large Arizona producers would close in a few months. The year closed strong. Lake Copper, 11 1/4¢ @ 11 1/2¢. The Cape Copper Co. reduced their dividends for 1885 to less than half of what they were in 1884.

Lowest and Highest Prices of Lake Superior Copper at New York, in Cents per Pound.

	1883.	1884.	1885.
January.....	17 1/4 @ 18	14 1/4 @ 15	11 @ 11 1/4
February.....	17 1/4 @ 18	14 1/4 @ 15	11 @ 11 1/4
March.....	16 @ 17 1/4	14 1/4 @ 15	11 @ 11 1/4
April.....	15 1/2 @ 16	14 1/4 @ 15	10 1/2 @ 11 1/4
May.....	15 1/2 @ 16	14 @ 14 1/4	11 1/4 @ 11 1/2
June.....	15 @ 15 1/2	14 @ 14 1/4	11 1/4 @ 11 1/2
July.....	15 1/2 @ 15 1/4	13 1/2 @ 14 1/4	11 @ 11 1/2
August.....	15 @ 15 1/4	13 1/2 @ 14 1/4	11 @ 11 1/2
September.....	15 1/2 @ 15 1/4	13 1/2 @ 14 1/4	11 @ 11 1/2
October.....	15 @ 15 1/4	13 @ 13 1/2	11 @ 11 1/2
November.....	14 1/2 @ 15	12 1/2 @ 13	10 1/2 @ 11
December.....	14 1/2 @ 15	11 @ 12 1/2	11 @ 11 1/2

(To be continued.)

A plan for the opening of a ship canal from Cleveland to the Ohio River has been perfected and surveys partially made. The route to be taken is the Ohio Canal and Muskingum River. With this connection completed a ship canal will be opened from New York to New Orleans via the Erie Canal, Lake Erie, Ohio Canal, Ohio and Mississippi rivers. The main part of the work will be from Trenton, Coshocton County, to Cleveland, along the Ohio Canal, a distance of 106 miles, which will cost about \$10,000,000. The Muskingum branch is now in condition for its new uses, save some dredging, and the matter will be duly represented to Congress. By this route ships would have to pass through only about 100 miles of canal from Cleveland to the Gulf of Mexico.

Recent discoveries of petroleum in Oregon and Washington Territory excite considerable inquiry. The Los Angeles Herald states that "the new pipe line for carrying petroleum from Newhall to San Buenaventura, a distance of 63 miles, is about completed. The first flow of oil from Newhall to the sea will be accomplished in a short time. The capacity of the pipe will enable the company to load a vessel every day. There seems to be little doubt that this industry will assume an important position in the future, and that crude and refined petroleum will become a staple product on the Pacific Coast."

The railroad enthusiasm in China appears to have met with a check, and a postponement of railroad building now seems to have been determined upon by the Government of the Son of Heaven. The last mail advices from China contain a special dispatch from Tientsin which says: "There will be no railways in China this year, the censors having objected to them as dangerous and likely to cause rebellion in the country." It has been suggested that the danger of rebellion will cease as soon as the Prime Minister can quietly arrange his contracts.

TRADE PUBLICATIONS.

Photographic Cameras, Lenses, &c.

Messrs. W. H. Walmsley & Co., of 1016 Chestnut street, Philadelphia, Pa., have issued a complete and very interesting catalogue illustrating and describing photographic cameras, lenses and other apparatus and materials for photography. It embraces 80 pages, is carefully indexed, and to the enthusiastic amateur and professional photographers will prove a store of much valuable information.

Steam Pumping Machinery.

A revised catalogue has been issued by the Knowles Steam Pump Works, of 93 Liberty street, New York, in which they give full particulars and illustrations of as many designs as possible of the Knowles improved pumping machinery. The catalogue embraces 102 pages of interesting matter.

Rock Drills.

The Ingersoll Rock Drill Co., of 10 Park place, New York, have issued a large illustrated circular devoted to the interests of the well-known Ingersoll drill. The illustrations refer especially to the work at the new Croton Aqueduct, showing an Ingersoll air-compressing plant at Shaft No. 10, and different styles of drills. A map and profile of the aqueduct, with detailed description, is also given.

Special Tools for Railway Repair Shops.

The L. B. Flanders Machine Works, of Philadelphia, Pa., have sent out a new and attractive catalogue illustrating and describing a number of special tools for railway repair shops. The merits of these tools have come to be extensively recognized by master mechanics and others interested, and have reached a high degree of excellence. Careful examination of the catalogue will accordingly be well repaid.

Steam Pumps.

A recent catalogue issued by the Hall Steam Pump Co., of 91 Liberty street, New York, supplies illustrations and descriptions of the Hall duplex steam pumps. Nine different styles are shown and sectional views are given, from which the arrangement of valves, plungers and pistons, &c., can be easily understood.

Optical Goods.

T. H. McAllister, 49 Nassau street, New York, has sent us a condensed list of optical goods, which may prove interesting to some of our readers. Telescopes, photographic outfits, compasses and other apparatus of the same general character are included in the pamphlet, which is fully illustrated and contains detailed price lists.

Pumps.

W. S. Blunt, 100 Beekman street, New York, has favored us with an extensive circular illustrating and briefly describing his improved universal force pumps, double-acting artesian well pumps, mushroom strainers, &c. Tables of sizes and price lists are given for every style of pump, making the circular of special interest to the trade.

A German newspaper has recently put forward the following table as covering the number of Bessemer converters and their capacity in the different producing countries in the world:

	Number of converters.	Capacity, metric tons.
Germany.....	80	1,690,000
Great Britain.....	115	1,461,000
United States.....	34	1,150,000
France.....	31	632,000
Belgium.....	30	380,000
Austria.....	35	350,000
Russia and Sweden.....	45	180,000
Total.....		5,833,000

We have rarely seen a more inaccurate statement. The United States is placed in the list as third, with a capacity of 1,150,000 tons, when in 1882 we made over 1,500,000 gross tons of Bessemer ingots. Since then the Worcester, Scranton, Riverside, Bellaire and Otis works have been running, and Bessemer plants are in course of construction, not counting the Clapp Griffiths works completed and going up. Besides this our leading works have increased their capacity considerably through improvements in detail. In July, 1882, Mr. Swank estimated the capacity at 2,150,000 net tons of ingots. In September, 1884, he placed it at 2,490,000 net tons, and we believe that we are not far from the truth when we state that the works now completed and those building will carry up the total to 2,300,000 gross tons, or double the figure given by our German contemporary, *Glockauf*. The capacity of Great Britain, too, is probably very much underrated. In 1882 the actual output was 1,673,000 gross tons. Since then a number of large basic and acid plants have been built, and it would be undoubtedly safe to put the capacity at 2,000,000 metric tons. Assuming that the statement of the other producing countries is fairly correct, we reach the following total:

	Metric tons.
Germany.....	1,690,000
Great Britain.....	2,000,000
United States.....	2,300,000
France.....	632,000
Belgium.....	380,000
Austria.....	350,000
Russia and Sweden.....	180,000
Total.....	7,522,000

This total is based upon the assumption that the capacity of Great Britain is not greater than 2,000,000 tons. Our German contemporary will be safe if it changes its total to about 7,500,000 and lets the Fatherland drop to third rank.

The annual report of the Pilot Commissioners show that there are 132 pilots in active service. During the year 6099 vessels inward and outward bound had been piloted, the fees for which were \$352,588.71.

The Association of German Civil Engineers, Chemists and Architects, of Philadelphia, will hereafter publish a quarterly review in which the lectures given at its meetings will be published.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, December 31, 1885.

DAVID WILLIAMS, Publisher and Proprietor.
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Iron and Steel Prices in 1885.

The greater part of the year just closing witnessed a continuance in the depression which bore so heavily upon the trade during 1884. Prices continued to fall during the first six months of the year, and while quotations do not closely reflect the minor shades of these fluctuations, there is no doubt that in nearly every commodity in every market the lowest prices for a long series of years were made. The adjustment of railroad troubles which came early in the fall, and the growing disposition of producers of iron and steel to work in harmony, coupled with a generally brighter outlook, led to an advance nearly along the whole line, an advance which continued in December. Yet, as will be seen in the following tables, the improvement has not yet carried values to the level they started from in the beginning of the year, except in a few instances, rails being particularly prominent among the latter.

In the following table we give the price in the first week in each month of 1885 for steel rails per gross ton at Eastern mill, best refined bar iron per pound at Philadelphia, No. 1 X standard anthracite foundry pig iron per gross ton at tidewater:

First week in	Steel rails.	Bar iron.	Pig iron.
January.....	\$28.00	\$1.80	\$18.00
February.....	26.50	1.75	18.00
March.....	26.50	1.80	18.00
April.....	26.50	1.80	18.00
May.....	27.00	1.75	18.00
June.....	27.00	1.75	18.00
July.....	27.00	1.70	17.50
August.....	27.00	1.70	17.50
September.....	29.00	1.70	17.50
October.....	30.00	1.70	18.00
November.....	30.00	1.70	18.00
December.....	33.50	1.70	18.00

For the purpose of comparison it is desirable to know the prices of leading iron articles at other points in the United States. We have compiled the necessary statements and present them in order, taking Pittsburgh first, at which point the following table shows the prices of No. 1 foundry coke pig iron, neutral gray forge pig iron and Bessemer pig iron, all per gross ton:

First week in	No. 1 foundry.	Neutral gray.	Bessemer.
January.....	\$18.00	\$15.75	\$18.00
February.....	18.00	15.50	18.00
March.....	18.00	15.25	17.50
April.....	17.50	15.00	17.50
May.....	17.00	14.75	17.50
June.....	16.50	14.50	17.50
July.....	17.00	14.50	17.50
August.....	17.00	14.50	17.00
September.....	16.50	14.75	17.00
October.....	17.00	14.75	17.00
November.....	17.50	14.50	17.50
December.....	19.75	15.00	18.50

The following table gives the price at Chicago of Lake Superior Nos. 4, 5 and 6 charcoal pig iron and Lake Superior Nos. 1, 2 and 3 charcoal pig iron, and at St. Louis:

No. 1 Missouri coke pig iron and No. 1 Missouri charcoal pig iron, all per gross ton:

	Chicago.	St. Louis.
First week in		
January.....	\$22.00	\$16.00
February.....	22.00	16.00
March.....	22.00	15.50
April.....	21.50	15.50
May.....	21.00	15.00
June.....	21.00	14.50
July.....	20.50	14.50
August.....	19.50	14.00
September.....	19.50	14.00
October.....	19.50	14.00
November.....	20.00	14.50
December.....	20.50	15.00

The following table gives a summary of the price at Cincinnati of No. 1 Hanging Rock charcoal pig iron, No. 1 Southern charcoal pig iron and No. 1 Southern coke pig iron, all per gross ton:

First week in	No. 1 H. R. charcoal.	No. 1 Southern charcoal.	No. 1 Southern coke.
January.....	\$21.00	\$18.50	\$17.00
February.....	20.50	18.50	16.50
March.....	21.00	18.00	16.00
April.....	21.00	18.00	16.50
May.....	21.00	18.50	16.50
June.....	21.00	18.50	16.50
July.....	21.00	18.50	16.00
August.....	20.00	17.50	15.50
September.....	20.00	17.50	16.00
October.....	20.00	17.50	16.00
November.....	20.00	17.50	16.00
December.....	20.00	17.50	16.50

The following table shows the price at Louisville of No. 1 Southern coke pig iron and No. 1 Southern charcoal pig iron, and at Chattanooga of No. 1 coke pig iron, small lots, all per gross ton:

First week in	No. 1 Southern coke.	No. 1 Southern charcoal.	No. 1 coke.
January.....	\$17.50	\$18.00	\$15.50
February.....	16.50	18.00	15.00
March.....	16.50	18.00	14.50
April.....	16.50	18.00	14.00
May.....	16.50	18.00	14.00
June.....	16.50	18.00	14.00
July.....	16.50	18.00	13.50
August.....	16.00	18.00	14.00
September.....	16.00	17.50	14.50
October.....	16.00	17.00	14.50
November.....	16.00	17.50	14.50
December.....	16.00	17.50	14.75

Inasmuch as the price of pig iron is usually an index to the condition of the iron trade, we present herewith, in order to show the course of prices for a comprehensive period, a table exhibiting the price of No. 1 anthracite foundry pig iron at tidewater in the first month of each quarter from 1870 to 1885 inclusive, per gross ton, as follows:

Years.	January.	April.	July.	October.
1870.....	\$26.25	\$32.25	\$32.75	\$32.25
1871.....	30.50	35.50	35.75	36.75
1872.....	37.00	40.50	51.25	53.25
1873.....	45.25	47.75	48.75	38.00
1874.....	32.40	32.00	31.50	30.00
1875.....	25.75	27.00	26.00	24.00
1876.....	23.25	22.75	22.00	21.75
1877.....	20.75	19.50	18.25	18.50
1878.....	18.50	18.50	17.25	17.00
1879.....	18.00	18.00	16.25	16.50
1880.....	40.00	31.00	23.50	33.00
1881.....	25.00	25.00	24.50	25.50
1882.....	26.00	27.50	25.50	26.25
1883.....	25.00	23.50	21.50	21.50
1884.....	20.50	20.00	19.00	19.50
1885.....	18.00	17.75	17.50	18.00

The fluctuations in the price of pig iron are clearly shown graphically in the diagram we publish this week. It is based upon the table compiled by the American Iron and Steel Association showing the prices of No. 1 anthracite foundry pig in Philadelphia per ton of 2240 pounds, which was kindly brought up to date for us. We have also drawn upon the report of the Iron and Steel Association for the figures of production of pig iron in net tons, for the prices of steel rails, and the production of rails.

The Coal Miners of the Hocking and Monongahela Valleys.

The miners and operators of the Hocking Valley, after a short period of idleness, and no doubt with a most distinct recollection of the misery and cost entailed by their last struggle, have wisely concluded to refer their difficulties to arbitration, and have elected their boards and chosen as their umpire the Hon. A. G. Thurman, who has accepted. There has been some delay in reaching a conclusion, because questions naturally arise as to the correctness of certain statements made which it necessarily takes time to verify. The miners' representatives in explaining this delay very pertinently remarked: "The great drawback so far has been manifested in our limited means of securing reliable information as to the coal trade generally, but this can be easily obviated by placing more men in the field, and for no other purpose than to look after the ups and downs of the different markets. This will not cost us much financially, and it will prevent much suffering and needless sacrifices on our part." It is just this lack of reliable information that is so often the cause of strikes and lockouts, and it is the opportunity offered labor of ascertaining the real condition of the market, and thus having an intelligent basis for their decisions, that is one of the great benefits of arbitration, especially if the boards have stated meetings at which these subjects are discussed, as they have in many industries in England. It is also found that the good feeling between miner and operator that results from these meetings tends to make the operators more willing to convince the miners by inspection of their books as to what is the real condition of trade. It remains to be seen whether the miners will accept the award of the umpire should the decision be against them, or whether they will take the course that their fellows at Pittsburgh did in refusing the

Weeks award last spring, though the scale presented was manifestly in the interest of the workmen and against the operators.

In the Monongahela Valley, though there are constant rumors that the strike, which has now continued for months, is drawing to an end, work has not yet been resumed. This strike is clearly doomed to failure. The surroundings of that market are such that it seems well-nigh impossible that the miners should win in the struggle. The lower market was overstocked with coal; other sections had come in to take a portion of the trade that these mines had heretofore enjoyed, and the largely-increased use of natural gas in the workshops and mills of Pittsburgh had greatly lessened the demand for coal. All these conditions made it impossible that the operators could continue to pay the price ruling a year ago, and it is believed that the miners would have recognized this fact and accepted the price offered, 2½ cents a bushel, which is the same price as is paid at the railroad pits in that city—indeed, is in excess of that paid at many railroad pits—had there not been other and complicating circumstances growing out of their relation to each other. It is understood in Pittsburgh that the cause, possibly not of the origin of this strike, but certainly of its long continuance, is a struggle for supremacy between two unions that aim to control the miners in Western Pennsylvania. It was such a struggle between two factions in the Miners' Association that led to the rejection of the Weeks award last spring. It was promises held out to the miners by a union other than the Miners' Union that led to the inception of the present strike, and it has been a foolish pride that would not permit them openly to acknowledge defeat that has led to the continuance of the struggle after those prominent in the strike have privately acknowledged that they were defeated. No words can be harsh enough and no punishment too severe for those who will thus, for their personal glory or to prevent a mortification of their pride, continue a struggle in the midst of so much suffering, want and crime as have marked the course of the present strike in the coal mines of Western Pennsylvania. One of these officials, after he had acknowledged that the contest was lost, when asked why he did not frankly say so to the miners, is reported to have replied that they would kill him—meaning, probably, that his influence as a leader would be utterly destroyed, as it certainly ought to be.

Productive Capacity.

During the past few years one of the stock arguments against an advance has been based upon the heavy capacity for production in nearly all lines of manufacturing. There can be no question that it has had its effect both upon buyers and sellers. No one will deny that to some extent the importance attached to the demoralizing influence of excessive capacity is fully justified. Works are kept going for a long time before the entire organization of any industrial establishment is allowed to scatter, and a trade which it has taken many years to establish is permitted to become the prey of rivals, before all hope of obtaining a moderate interest upon capital invested is abandoned, and the certainty of making annual outlays for the care of an idle plant is faced. The considerations guiding manufacturers in times of depression vary with the character of their product. Crude articles having a recognized standing in the markets usually have less to fear from a temporary loss of trade, while manufactured goods which are ready for the consumer demand sacrifices for the sake of keeping them before the buyer. In the iron and steel trades there is little trouble from one potent cause for mischief due to dangers growing out of the management of joint-stock concerns. Those at the head of establishments organized in this manner very often have a deeper interest in retaining their places as salaried officers than they have as holders of its securities. Cessation of work means loss of employment, and only too often the result is running of the establishment until reserves, working capital and credit are exhausted. Another cause leading to deepening of times of depression is that works partially employed at rates offering the promise of small returns strive to obtain more orders to reduce general expenses by a distribution over a larger product.

All these factors tend toward impressing upon all engaged in the trade with the magnitude of production, and naturally make it unpleasant to them to contemplate how much capacity is idle. Thus the data collected by *The Iron Age* show that while there were on the 1st of December only 254 blast furnaces running, producing at the rate of 84,066 tons per week, there were no less than 413 idle, which are estimated to be capable of producing 88,937 tons per week. Our Bessemer steel works produced during the first six months at the rate of 1,525,000 net tons for the year, when their capacity is probably very near, if not more than, 2,750,000 tons. Similar figures might be adduced for rolling mills, nail works, open-hearth steel furnaces and crucible plants.

Figures like these on the face of them are well calculated to discourage those who have suffered from keen competition for years, and yet their magnitude loses much of its significance when contemplated in a different way. The true way to consider productive capacity is to couple it with

cost. For instance, let it be assumed, for the sake of illustration, that 50 per cent. of the aggregate capacity of the blast furnaces of the country can, with the lowest figures for fuel, labor and ore, turn out pig iron at \$15 as an average, f.o.b. cars at furnace. Let us say that 60 per cent. could do it at \$16. The increased demand for raw materials would increase the price of the latter, and furnaces capable of turning out iron at \$17 at bed-rock prices would find that there would be no profit unless the demand warranted a \$10 market. Let it be assumed that an additional 10 per cent. of the capacity would cease to be idle when that point was reached. It will be readily understood how rapidly the price would have to advance to put other furnaces into blast, since the quickening of the demand in all raw materials would rush the latter up so that only a boom could aid the antiquated plants or galvanize into life works unfavorably located and poorly equipped to cope with modern furnaces. On a rising market idle producers very quickly find how futile it is to attempt to base estimates of cost on prices of raw materials offered them only a short time before. They discover, for instance, that when an advance of \$1 a ton has been established in pig iron, ore, too, has risen 25 or 40 cents, fuel is firmer, freights have hardened, and labor is not daily knocking at their doors.

A striking instance of how high prices do not bring out the nominal maximum capacity is furnished by the actual output in the year 1882. Then our furnaces turned out 5,178,122 net tons of pig iron, while the capacity was rated by Mr. James M. Swank at 8,000,000 net tons on July 25, 1882. This, of course, is partly due to the fact that pig iron manufacture is not so elastic in adapting itself to sudden changes in the demand, and that the latter is at times speculatively exaggerated. The distance of some of our leading ore districts and their inaccessibility in certain seasons of the year make more prominent still the trouble always experienced after long times of depression in rendering productive mines which have been partially or wholly abandoned, are flooded or have been allowed to cave. This, of course, affects the furnaces and they again retard the mills. To some extent this year the severe effects of these natural causes have been tempered by the fact that the steel-rail combination has led to an anticipation of orders far greater than usual. That will give the ore producers and the furnacemen time for preparation. It is true that it has swept away the stocks of ore, and has created what is more an apparent than a real scarcity. The latter will tell more on the steel works which make steel for rails and miscellaneous purposes than it will on the rail mills, especially if the strike at the Western rail mills should soon cease. It will tend to prolong the life of the iron mill, and give more employment to the puddler than he would otherwise have.

It is dangerous, therefore, to be lulled into too great a sense of security through the contemplation of the figures of nominal capacity. Alone the change in the attitude of sellers from one of anxiety to a position of confidence in the future tends to harden values of raw materials and makes it difficult for idle works to resume operations except at a greater advance than those themselves who manage them were led to believe. While there are a good many influences at work to discourage a boom, the position of the idle works is by no means such as to act so promptly as safety valves as might be believed. Many of them are financially weak, and it will require the infusion of new capital before they can begin operations. That is not a matter of a day, but can only be brought about by prolonged negotiations.

The Sectional Boiler.

A short time ago we found in one of our exchanges an article of some length, extolling the virtues of the sectional boiler and presenting its advantages in a way designed to leave little doubts as to its absolute superiority over any other form of steam generator. Everybody will, of course, admit that the favor with which the sectional boiler is regarded in some quarters is not without a good basis, but at the same time it should be remembered that it has not altogether met the requirements of safety and economy, and that, all things considered, it is not the pre-eminent representative of boilers generally. In point of safety its claims have been disputed on the ground that while not many accidents have occurred with such boilers, and not many lives have been lost, there has been a fair proportion if we bear in mind that the number of boilers of this class now at work is comparatively small. As regards cost, it is well known that some sectional boilers are high in price, and the greater first cost, from a comparative point of view, is supposed to soon be more than counterbalanced by the saving effected in actual work. This assumption, however, naturally introduces the question of relative economy, which has not yet been satisfactorily answered, and which should be carefully considered in every detail.

The question "What kind of boiler is the best?" frequently suggests itself to steam users, and the choice is often based on the advice of some who may have pecuniary interests at stake. The results, therefore, are not always satisfactory. General excellence, and not special features gained at the expense of the former is the standard by

which boilers should be, but are not always, judged. High evaporative powers, with consequent fuel economy, are of unquestioned importance, but they are not the only factors which should be considered in making a selection. Durability and freedom from oft-repeated repairs are entitled to more than passing thought, and some of the advantages in other directions, often inappreciable, and in some cases perhaps largely imaginary, may unhesitatingly be sacrificed for them. It is on the whole a difficult task to give specific directions for choosing a boiler which will prove the best, and any attempts without intimate acquaintance with all the conditions entering the problem cannot be expected to turn out as successfully as may have been anticipated.

Assuming that first cost, simplicity in construction and ease of access for repairs and cleaning are points of great importance, and such they undoubtedly are, the horizontal tubular or flue boiler at once suggests itself as a "prominent candidate for favor." It is the boiler in general use the country over, and, when properly constructed and properly set, is generally considered as economical as any boiler yet devised. It is well adapted to the various conditions under which boilers are used in all parts of the country, and all kinds of fuel can be used, and it can be easily and readily repaired by ordinary boiler-makers. This in places remote from great centers is a great advantage, and even in the most satisfactory location may avoid expensive delays. It does not, moreover, exhibit a marked tendency to prime or to boil dry, demerits of the sectional boiler which are not disputed by even its most pronounced advocates. General excellence has in this boiler evidently been the prominent object, and the high esteem in which it is held is aptly demonstrated by its popularity. We do not wish to detract in any way from the established and acknowledged merits of the sectional boiler, but it should be understood that it is certainly not the paragon of excellence which some consider it to be.

New Uses for Blast-Furnace Cinder.

Among the many efforts made to utilize that often troublesome by-product of the blast furnace, the cinder, none is so promising or has made so much headway of late than its use in cement manufacture. The matter was brought prominently forward some time since in the North of England by Mr. C. Wood before the Iron and Steel Institute, but of late little information has reached the public through the medium of the press. In other quarters, however, a fierce contest is being waged over the introduction of blast-furnace cinder as a material entering into cement manufacture. In Germany the Association of Portland Cement Makers are using every means to prejudice consumers, and, to tell the truth, to begot the public. It is contended that blast-furnace slag is used to adulterate Portland cement, and the tests made by Dr. Fresenius, of Wiesbaden, seem to bear out the assertion that the admixture of the new raw material drags down the quality, so that the sellers of it are simply defrauding the buyers. It is stated, too, on very good evidence, that frost plays havoc with Portland cement so adulterated. These facts, which it seems impossible to question, certainly justify the condemnation of the article of which the German Association of Cement Manufacturers complain. A closer study of the matter shows, however, that their position is, to say the least, a very equivocal one, because they ignore or pretend not to know that there is a very wide difference in furnace slags so far as their adaptability as a raw material is concerned. It may be stated at once that that class of cinder which soon after chilling falls to dust possesses no hydraulic qualities as such. To use it to adulterate cement is simply fraud, against which honest producers and consumers have a right to protest emphatically. When, however, the cinder is granulated by running it into water it acquires properties which, if the composition is favorable, fit it for cement manufacture. A high percentage of alumina appears to be one of the requisites. The different steps in the process are granulating the cinder at the furnace, burning and slaking the lime to be used as an addition, drying the slag sand, grinding it, sifting slag sand and lime, mixing and barreling. The cement thus produced is considerably cheaper than ordinary Portland cement, and tests carefully carried out by so eminent an authority as Professor Tetmajer prove that for all practical purposes it is equal in quality to its better known competitor. It is somewhat difficult in view of these facts to escape the conclusion that the sweeping attacks of the Portland cement makers are not so much directed against an abuse worthy of condemnation as they are the outgrowth of a feeling of hostility against a dangerous rival.

In the flush of excitement over the early successes of the basic process enthusiastic admirers predicted that the much-dreaded phosphorus would become a positive blessing. It was pointed out triumphantly that the slag produced during the blow, containing as it did large quantities of phosphoric acid, would become a valuable raw material for the manufacture of superphosphates for fertilizers. A large number of inventors brought forward methods destined to supplant phosphate rock by basic slag in this manufacture, but not one of them has been able to show that it could be done at a profit.

Practically this was acknowledged by Dr. Scheibler, who has most carefully studied these questions, and who himself is the inventor of an ingenious method. One of the principal reasons for his failure to obtain financially favorable results is that hydrochloric acid has risen in value through the substitution of the Solvay ammonia for the Leblanc process in soda manufacture. It would, of course, be premature to deny any future to the utilization of basic cinder as a raw material for superphosphate fertilizers, because the problem is one which has not been studied for a long time. Under the circumstances it is interesting, however, to note the experience obtained in another direction. It was found a number of years ago in Germany that for certain soils it is not at all necessary to convert the phosphates in the soluble form, and that in some soils the insoluble phosphates actually did better than the superphosphates. This led G. Hoyermann, a German manufacturer of fertilizers, to study the question whether basic slag, ground to a very fine powder, could not be advantageously used in the crude state. It appears that exposure to the atmosphere of the highly calcareous slag leads to its disintegration, and the result is that comparative

prove a valuable adjunct to, and will not necessarily be a competitor of, the superphosphates now so widely used.

Forced Draft for Boilers.

In view of the rapid advances in steam engine economy during the past twenty-five years and the fact that improvement in that time has been almost exclusively confined to the engine proper, and scarcely, if at all, connected with the generator, it is not surprising that investigations as to better methods in boiler practice are now being actively carried on, and have in several instances already yielded gratifying results. Forced draft has very naturally suggested itself as an excellent subject for experiment, for, though it has hitherto been found generally that with slow combustion judiciously carried out a high evaporative economy could be effected by natural draft, increasing rates of combustion produced a steady falling off in this economy. Combustion under pressure accordingly came to be looked upon as a ready means of overcoming the difficulty, and with few exceptions there has been no lack of encouragement to experimenters in this direction. The plan

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., December 29, 1885.

In anticipation of a reopening of the tariff the industries most likely to be the target of the efforts of the reductionists are making preparations not only for general resistance, but by combinations with other interests expect to be able to hold the balance of power on the final issue. The success of Mr. Morrison, the coming chairman of the Committee on Ways and Means of the Forty-ninth Congress, in amending the rules introduces an unknown element in the contest, which may exert an important bearing on the result. The contest, ostensibly on a modification of the rules as affecting the business of the Committee on Appropriations, was, in fact, a struggle between Mr. Morrison and Mr. Randall, forced by the former upon the latter for the leadership of the House. It is now conceded that Mr. Morrison occupies that place, but it still remains to be seen whether he will be equal to the emergency. Many predict that his attempts to completely suppress the conservative wing of his party on economic questions will lead to combinations and complications which will create so much dissension that it will eventually lead to his overthrow. The present situation of affairs, however, indicates an interesting and exciting controversy when the contest does begin.

as to make the change without substituting a sufficient rate to keep the specific duty at about the same rate as at present.

Mr. Mills, of Texas, has also labored long on a pet measure, which in reality is the Walker recommendations and tariff of 1846, only more so. He says he will insist upon his measure, not only as more symmetrical in its operations, but as having the merit of actual test before the War Tariff of 1860-72. Mr. Hewitt will also insist upon his unwrought material and customs administration bill. These three measures will undoubtedly cause much friction in committee. With the Democratic vote divided on these three propositions, and the Republicans voting against each, it may be more of a job than now appears to get a bill out of the committee. The failure of Mr. Morrison's last bill, and the efforts of Mr. Hewitt to have his substituted in committee, which were nipped in the bud by Mr. Morrison, very much annoyed Mr. Hewitt, which resulted in some feeling and led Mr. Hewitt to remark to the correspondent of *The Iron Age* at the time that he would not serve on the committee again if Mr. Morrison were at the head of it. Mr. Morrison will be at the head of it, and there is talk of placing Mr. Hewitt at the head of some other important committee.

CRITICISING MR. MANNING'S VIEWS.

The editorial in *The Iron Age* analyzing the views expressed by Secretary Manning

protection and a few Democrats, like McPherson, of New Jersey, and Voorhees, of Indiana, who are not considered by their colleagues as reliable on free trade. So the question in the Senate may be a stand-off. The seriousness of the matter, however, is not so much in the present as in the future.

RECENT DECISIONS.

The Secretary of the Treasury has rendered the following decisions in customs cases arising under the metal schedules:

1. Certain so-called bellows nails, consisting of short nails with heads about 5/8 inch in diameter, which are generally used in the manufacture of blacksmiths' bellows, and are made from cast-iron rendered malleable by a subsequent process of heating, are not the malleable-iron castings specified in Schedule C, T. I., new, 161, but are dutiable at the rate of 4 cents per pound by assimilation, under Section 2499, Revised Statutes, to wrought-iron nails, which are provided for in said schedule, T. I., new, 168, as "all other wrought-iron nails," not specially enumerated or provided for.

So-called needles, which, upon investigation, are found to consist of small pieces of iron 1 1/2 inches in length, and pierced with three small holes for the purpose of being attached to neckties as a fastener, are dutiable at the rate of 45 per cent. ad valorem, under the provision in Schedule C, T. I., new, 216, for "manufactures, articles or wares," * * * composed wholly or in

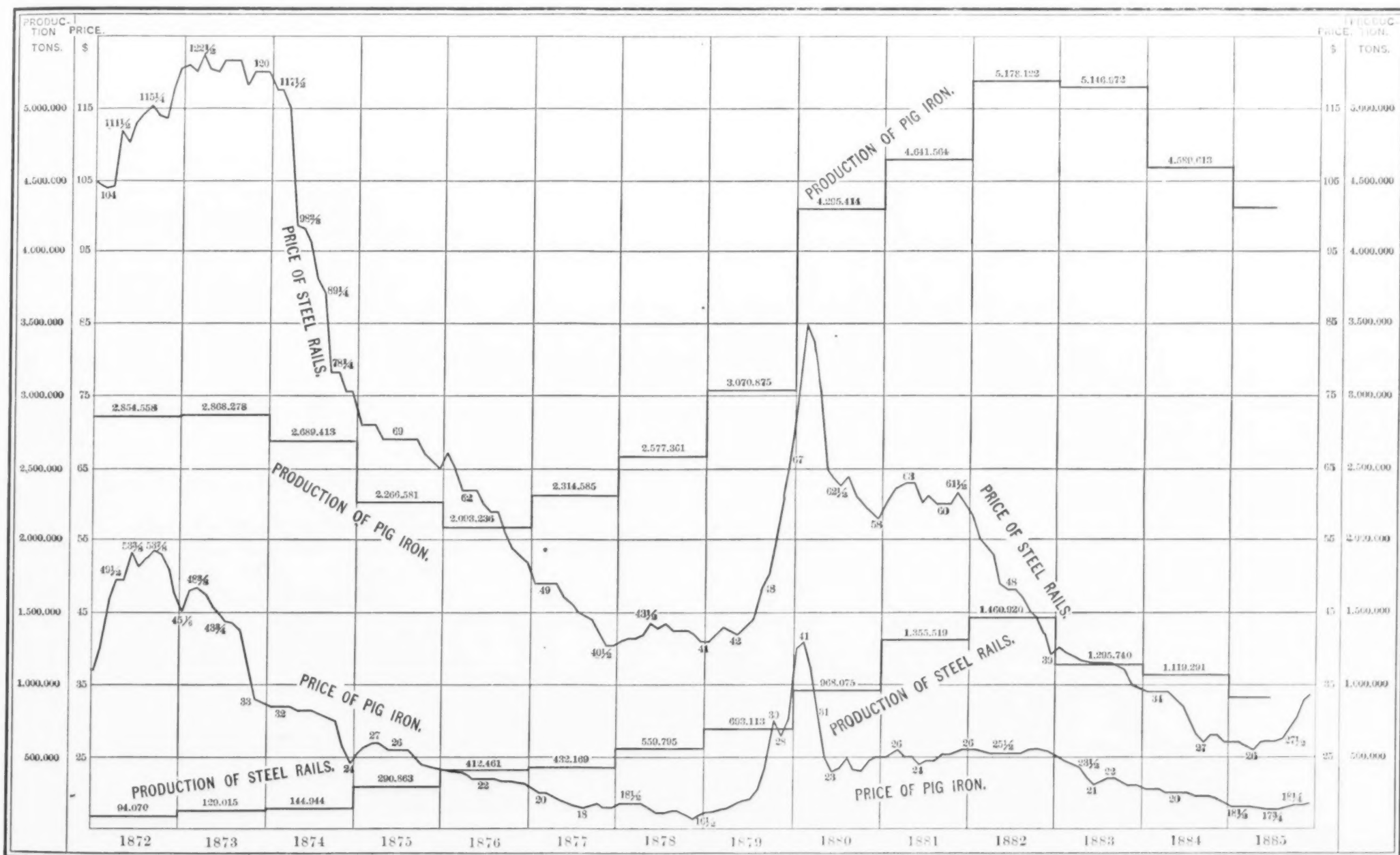


Diagram Showing Production and Price of Pig Iron and Steel Rails, 1872 to 1885.

experiments with different fertilizers, on both poor and rich soils, have proven that ground basic slag improves their yield materially and ranks among the best—in fact, in some cases doing better than any other. The Peine Basic Steel Works are now selling annually 25,000 tons of their slag, and an equal amount, the balance of their product, is to be taken by a second fertilizer works, just established. Hoyermann lets the slag disintegrate through exposure to the air for some time, and then grinds it fine. The Peine slag carried about 20 per cent. of phosphoric acid, 50 per cent. of lime, 5 per cent. of magnesia, 6 per cent. of silica, 11 per cent. of iron, 2 per cent. of manganese, and 1 per cent. of sulphur. While there seem to be grades of slag which are not sufficiently high in phosphoric acid to be of much value, the introduction of this new raw fertilizer has been so encouraging in its results that there are now five grinding mills in Germany. If practice in the future were to teach that availability for the purpose depends simply on contents of phosphoric acid, then an observation made by Professor Scheibler will be particularly interesting. That gentleman has found that, if molten basic slag is allowed to cool slowly, that part of it which remains liquid for the longest period contains a much higher percentage of phosphoric acid. By letting masses of slag cool and tapping the liquid contents within the chilled shell he has carried the phosphoric acid contents up from 15 to 20 per cent. to 32 to 35 per cent.

Thus an outlet for a part of the cinder from the new process has been assured. For what soils cinder slag is best adapted, and what range of chemical composition covers the limits, only longer use can show. At present it seems that the new fertilizer will

which has probably been most frequently tried is that of forcing air by a fan or other blower into a closed ash-pit. This method of increasing the power of a furnace, however, though apparently simple, has generally proved disappointing. Other methods, such as that of exhausting the air in the chimney by a fan, or of producing an induced current by means of a steam jet in the chimney, or, again, of increasing the air supply to the fuel above the grate by currents induced by steam jets penetrating the fuel, have all been tested and found more or less efficient.

From what has thus far been done it appears to be certain that the calorimeter which will best suit a natural draft is not that best adapted to a forced draft, and that apparently the proper method of working a boiler with forced draft is to obstruct the smoke-box ends of the tubes with thick ferules. The gases will rush through these at a very high velocity, while in other parts of the tubes their motion will be comparatively slow. Some amount of whirling will also be set up, which is highly advantageous. It has been pointed out that one of the great defects of marine and locomotive boilers is that the products of combustion move in lines parallel with the tubes, whereas, under all circumstances, the greatest value is obtained from the heating surfaces when the hot gases strike them at right angles. In no case, moreover, can too much care be taken to prevent the formation of hot and cold layers in the products of combustion. The experiments conducted at the Brooklyn Navy-Yard some time ago, and to which we referred in our issue of August 13, 1885, though far from exhaustive, have very strikingly shown what can be expected of forced draft if judiciously applied, and that with all its disadvantages the inducements which it extends are not to be ignored.

The chief elements of antagonism to Mr. Morrison's anti-tariff schemes will be the organized opposition of the Western iron interests. The gentlemen representing these interests declined absolutely to contribute any information to Secretary Manning in reply to his circular of tariff inquiry, and are fully equipped for action. The tobacco-growing interests have combined in various parts of the country, and will demand an increase of duties on certain classes of unwrought materials in their line. The wool growers have appointed committees and are not only at work on their Representatives, but will have representatives here to watch their interests. The activity of the lumbering interests in Canada has aroused the lumbermen of Maine, Michigan and other sections engaged in this branch of industry. The fishing interests of New England have put in their protest against the admission of Canada fish free, and are also opposing any negotiations to renew the fishery provisions of the Treaty of Washington. The ore and coal industries will also be represented, and both carry great influence, as their operations are of value both East and West and in portions of the South.

RIVAL PROPOSITIONS.

There is another element which may have some effect in shaping the outcome of the contest, and that is the rivalry of antagonistic measures proposed by the managers of pro British legislation. Mr. Morrison feels encouraged to go a step further in his treatment of the tariff question by moderating his horizontal scheme and striking directly at lower ad valorem and specific rates on specified articles, besides increasing the free list in accordance with the ideas propounded by Secretary Manning in regard to unwrought materials and necessities, so-called. He will also propose radical modifications under the cloak of changing from ad valorem to specific duties. He will work the fraud business for all it is worth, and expects to be able to bring about that end in such a shape

in the tariff portions of his report has found its way to the attention of Senators and Representatives, and has evidently furnished the cue to a very clear and comprehensive view of the operations of the Secretary's suggestions. It will doubtless furnish the text and be elaborated upon in many speeches. It will explode the old ideas, so frequently and ignorantly put forth in both Houses of Congress, in reference to high average ad valorem duties. It is evident that if more national legislators were to read *The Iron Age* they would save themselves from frequent displays of ignorance.

SENATOR EVARTS ON THE TARIFF.

Senator Evarts will make a speech on the tariff when the question comes up for discussion in the Senate. He will treat it, however, from the standpoint of labor, to show that the labor of the country has a more vital interest in the maintenance of the tariff than even the manufacturers, and instead of directing their efforts toward crippling industry by strikes and other methods they had better unite to uphold it and fix such duties as will enlarge the diversity of industry, and thus give scope for the turning of labor into new branches. There is at least \$200,000,000 value of imported merchandise which could be produced in the United States to advantage by proper encouragement. The solution of the labor question is therefore not in strikes and combinations against capital, but in co-operation and support as indicated.

SENATOR CAMERON'S RESOLUTION.

The Committee on Finance are receiving a large number of letters and resolutions indorsing the resolution now before them against the renewal of the tariff controversy. The agitators in the House, however, will not be deterred on that account. They propose to make the issue, they say, if only for campaign purposes in the Congressional campaign of 1886. The question in the Senate is hardly a party matter. There are several Republicans who are decidedly weak on

part of iron," the same not being needles within the meaning of that provision.

Britannia-ware medals, imported for the use of a church, are not entitled to free entry. They are not regular within the meaning of the term as used in the law, and neither are they exempt from duty under the special provision for "medals of gold, silver or copper."

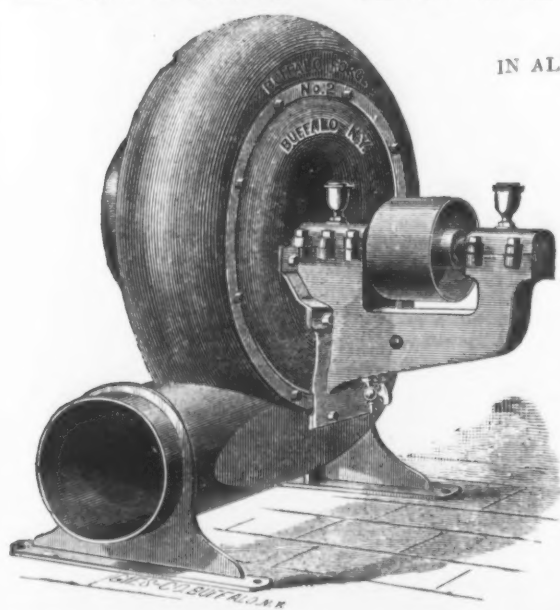
Certain imported linen and cotton piano and table covers, returned by the appraiser to be manufactures of flax, cotton and metal, are dutiable, regardless of chief value of either of such materials, at the rate of 45 per cent. ad valorem, under the provision in Schedule C, T. I., new, 216, for "manufactures, articles or wares," * * * composed in part of * * * metal."

A REAPPRAISEMENT FINAL.

When a reappraisement was had, where the parties obtaining it did not object at the time of holding the reappraisement to the merchant who acted as merchant appraiser thereon, and where the other proceedings thereon were regular and proper, the same is final and conclusive on all parties, the department having no authority to interfere under the statute.

Benjamin Tatham died on Friday, 25th inst., at his residence in this city, of pneumonia, after an illness of five days, in the 71st year of his age. Mr. Tatham was born in 1814, at Claremont, near Philadelphia. He had been in business for 42 years as a member of the firm of Tatham & Brothers, lead manufacturers, of No. 82 Beekman street. The firm consisted of five brothers, two in New York and three in Philadelphia, of whom Benjamin was the third in age. He was a prominent member of the Society of Friends, and at one time had been Indian Commissioner. He had always taken great interest in benevolent matters, and had done much toward improving the condition of the negroes and Indians.

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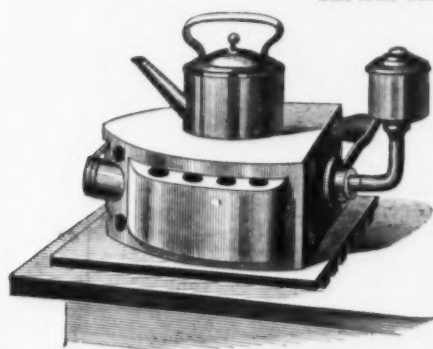
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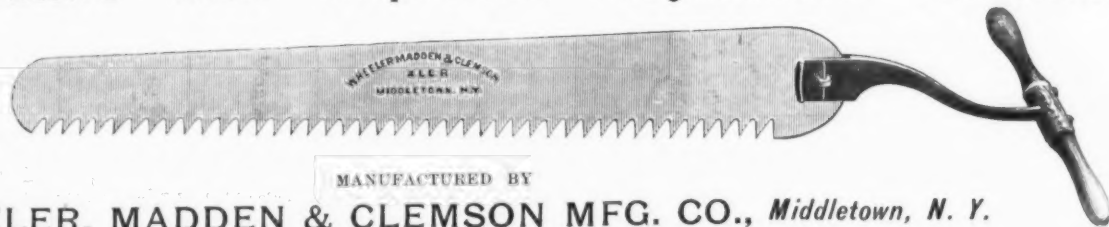
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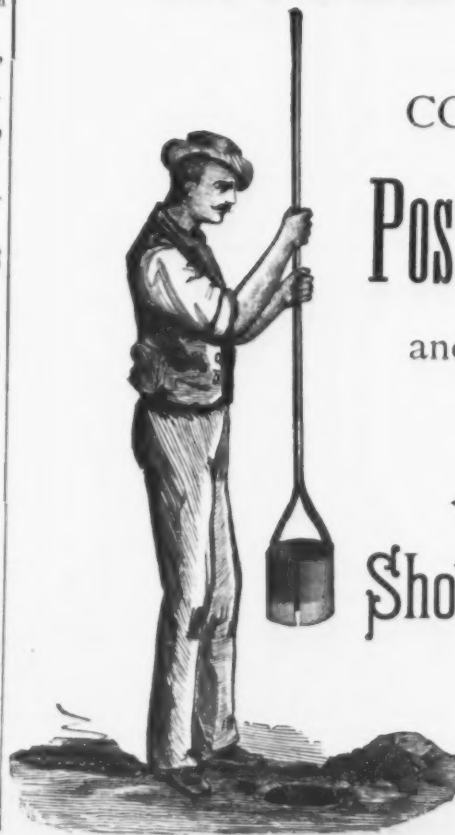
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Shovels and Spades.



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APPLICATION.

THE Iron Age Directory

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Trade Report.

New York Iron Market.

American Pig.—As yet no favorable announcement of the prices at which contract sales for 1886 are to be made has been put forth. There is considerable curiosity as to what the outcome will be, but well-informed sellers intimate that the conditions are not now as favorable as they were a few weeks ago. The furnace companies have a number of inquiries covering the year 1886, but they prefer to await developments. It is hinted that probably \$16, \$17 and \$18 will be the figures for Forge, No. 2 and No. 1 Foundry respectively. Current business is small. Some of the Southern furnaces claim to be well sold ahead, and to be getting better figures in other markets. Others are ready to book orders for large quantities, and it is urged that any notable advance will divert heavier quantities to this market. We quote standard brands of Lehigh and North River Irons, tidewater delivery, nominally as follows: No. 1 X Foundry, \$18 @ \$18.50; No. 2 X Foundry, \$16 @ \$16.50; Gray Forge, \$15.50. Outside brands sell for 50¢ @ 75¢ less than our quotations.

Scotch Pig.—Dispatches from Glasgow state that the stocks in the hands of furnacemen and in stores are 230,000 tons greater than they were a year ago, carrying the total stock to above 1,000,000 tons in Scotland. Freight continues high, but concessions follow delay on the part of shippers to meet such demands. We quote nominally as follows for small lots: Coltness, \$20.50 @ \$21 to arrive; Gartsherrie, \$20 @ \$20.50 to arrive; Shotts, \$20.50 @ \$21 to arrive; Carnbroe and Glegarnock, \$19.50 to arrive; Summerlee, \$20 @ \$20.50 to arrive; Dalmellington, \$19 @ \$19.50 to arrive; Eglinton, \$18 @ \$18.50 to arrive, and Clyde, \$18.50 @ \$19 to arrive.

Bessemer Pig.—The market is dull. Buyers' and sellers' views are too far apart; the latter are asking \$20.50. It is reported that lots bought on speculation are about to arrive here during the next two months, which, being unsold, may press upon the market. In our last issue, by a typographical error, we quoted the sale of the Viscaya Pig at \$4.25, f.o.b. Bilbao. It should have been 42.5 shillings.

Spiegeleisen.—The week has been a very quiet one. We quote nominally \$28 for 20 % English Spiegeleisen, and \$67 for 80 % Ferromanganese.

Bar Iron.—The market is irregular. In a number of instances considerably better prices have been paid for Common Iron, sales of round lots being reported at 1.55¢ and at 1.60¢. Store prices, too, are firmer. We quote for delivery here in round lots: Common Iron, 1.50¢ @ 1.60¢; Medium, 1.60¢ @ 1.7¢, and Refined Iron, 1.75¢ @ 1.9¢, with half extras. Steel, 1.85¢ @ 2.10¢ base, according to quality. Store prices are 1.70¢ @ 1.75¢ for Common, 1.80¢ @ 1.85¢ for Medium, and 1.9¢ @ 2¢ for Refined.

Structural Iron.—For the season there is a fair amount of business. While it is not to be expected that there will be a very heavy amount of building during the coming season, it is known that the erection of a number of large office buildings is contemplated, each of which will require round lots of Beams. We quote Angles 1.95¢ @ 2¢, delivered, and Tees at 2.25¢ @ 2.35¢ for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.5¢ @ 2.7¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

Plates.—We quote for round lots: Common or Tank, 2¢ @ 2.1¢; Refined, 2¼¢ @ 2½¢; Shell, 2.4¢ @ 2½¢; Flange, 3.4¢ @ 3½¢; Extra Flange, 4¢ @ 4¼¢. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2½¢ on dock; Boiler, 3¢ @ 3¼¢ for Shell, 3½¢ @ 4¢ for Flange, and 4¢ @ 5½¢ for Extra Flange and Fire-Box.

Merchant Steel.—In the middle of January a meeting is to be held of the producers of Open-Hearth Bessemer and Crucible Steel. Quotations for the range from ordinary to good grades are as follows: American Tool Steel, 7½¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13½¢ @ 15½¢; Common grades, 7¢ @ 9¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2½¢ @ 2¼¢; Open-Hearth Machinery, 2½¢ @ 2¼¢, and Bessemer Machinery, 2¢ @ 2¼¢.

Steel Rails.—The Pennsylvania Steel Co. have recently booked an order for 10,000 tons of Rails for the Chicago, Burlington and Quincy Railroad, the same railroad which bought English Rails recently because of their alleged superior quality. A number of the mills are well filled with orders to the middle of 1886, and are asking \$35. There are orders for early delivery at hand, which there is some difficulty in filling. The market is quiet and steady. The reports in the daily press concerning the resumption of Rail manufacture at the old Vulcan Mill, at St. Louis, leased by Youngstown parties, largely exaggerate the capacity of that plant, which place it at 500 tons of Rails per day, besides a certain amount for Nail Slabs and Special Steels.

Steel Wire Rods.—The market is quiet, with sellers reluctant to book orders. Offers of \$42 for 1000-ton lots, spring delivery, have been declined. We quote nominally \$42.50.

Old Rails.—With the exception of a few transactions at private terms very little is being done. There are a good many conflicting rumors and reports that holders are asking very high figures. We learn that \$21 is bid and \$22 asked. English advices are to the effect that a steamer has sailed from Liverpool with a round lot of Old Rails for this port. It is surmised in the trade here that they were purchased for speculative account. Present prices abroad are too high now to admit of business here.

Crop Ends.—There is some demand, but prices in England have risen so as to make it impossible to sell at recent figures here. Very little has been done during the week. We quote \$22.25 @ \$22.50 for Welsh and West Coast.

Scrap.—Holders continue to ask \$19 @ \$20 from yard for No. 1 Wrought.

Rail Fastenings.—We quote 2.25¢ for Spikes, 2.75¢ for Bolts and Square Nuts, 2.9¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.7¢ @ 1.75¢ for Splice Bars.

The Bellefonte Nail Works, S. A. Haines, agent, 90 Chambers street, this city, having begun to make Nails from Old Steel Rails, are buyers of the latter in round lots.

Metal Exchange.

The following transactions are reported to have taken place on the floor of the Metal Exchange:

WEDNESDAY, December 23.
500 tons Pig Iron Certificates, April, \$17.87½
THURSDAY, December 17.
10 tons Tin, December 20.60¢

Philadelphia.

Office of The Iron Age, 230 South Fourth St., PHILADELPHIA, December 23, 1885.

Pig Iron.—The year now closing has been a rather unprofitable one on the whole, especially so during the first seven months. During August and September the lowest figures were reached, and from that time to the present some little progress has been made in the opposite direction. This remark applies to all descriptions of Iron; some articles show considerable improvement, others very little. The tendency toward better prices is so clearly marked, however, that for the first time since 1880 it can be said that the year closes on a firm and advancing market. There is a diversity of opinion in regard to the permanency and extent of the improvement, but they are few indeed who have failed to realize the change in some shape or other. Some imagine that a recurrence of the times of 1880 and 1882 is at hand, but a careful consideration of the position seems to preclude anything of that kind. The conditions are entirely different. At that time an era of railway building was in progress unparalleled in the history of this or any other country. The Northern Pacific, the Denver and Rio Grande, the Mexican, the Southwestern, the West Shore and other roads were all being built and equipped. The elevated railway system in New York City was also being built and extended. Shipbuilding (which is now almost entirely at a standstill) was carried on extensively, and, in fact, every industry in the land seemed to start into full activity at once. The completion of these enterprises naturally led to a reaction, which was the more severely felt because of the vast increase that had been made in the capacity for production and, perhaps still more, because of the millions of tons of foreign material which floated in on the absurdly high prices that prevailed during that period of inflation. The present movement is not likely to have any of these exceptional features, but will probably be more permanent, because of its more legitimate character. It is, of course, impossible to say with certainty what the ultimate outcome will be, but the most experienced business men are of the opinion that the change of feeling is due to a general exhaustion of surplus stocks, absolute confidence in values, and the certainty of a larger and more remunerative business during the next two or three years. Capital is already seeking new avenues of investment, and in every direction the wheels of commerce are moving with increased freedom. In other words, the country is about in its normal condition and likely to furnish sufficient demand for everything in reasonable proportion to capacity for production. Prices will naturally show an improving tendency, inasmuch as some advance will be necessary to secure supplies adequate to the demand. At the same time there is no reason whatever, nor likely to be, for any advance beyond \$20 for No. 1 Foundry Iron and 2¢ for Bar Iron, but these figures, which are only reasonable, ought to be and probably will be realized before 1886 is half gone.

The year opened with prices nominally about as quoted to-day, but the rates actually realized varied all the way from 50¢ to \$1 ¾ ton below the asking figures. This continued for nearly eight months, sales during July and August having been made as low as \$14.50 for standard brands of Gray Forge, delivered at tide, and \$17 for No. 1 Foundry. The majority of sales, however, were at about \$15 and \$17.50 respectively, with decided weakness during the summer months even at these figures. Commencing with September, prices began to improve a little, and, although there was a very slight reaction during the early portion of November, the year closes with a clear and decided advance of about \$1 50 ¾ ton from the prices ruling during the midsummer months. At these figures the supply is barely adequate to the demand, although production is estimated at nearly 50,000 tons per month greater than it was during the first nine months of the year. In this connection it should be remembered that the Bessemer companies are taking a very unusual quantity of domestic Iron, so that the large increase in production does not by any means indicate a corresponding increase in consumption in the ordinary class of trade. There is undoubtedly an improvement along the entire line, but, judging by reports covering nearly all departments of trade, the movement in this section of country is, to say the least, more in anticipation than in actual reality. There is reason to believe, however, that the West and South are decidedly ahead in this respect and that the East will participate in the improvement later on.

Prices are not fully established at present, so it is difficult to say what will be done 30 or 60 days hence. Buyers would be willing to contract largely on the basis of \$15.50 @ \$16 for Gray Forge and \$18 @ \$18.50 for No. 1 Foundry, tidewater deliveries, but with one or two exceptions the disposition is to name 50¢ @ \$1 more. The Thomas Iron Co. have made no announcement so far, but up to this date are entering orders at \$16 and \$18 for deliveries early in the new year. Others are evidently waiting developments, with the probabilities in favor of a slight advance, which, considering the increased cost of Ores, fuel, freight, &c., will leave them very little better off than they were before. The opinion prevails, however, that if nothing unfavorable occurs prices will work up to \$20 for No. 1 Foundry Iron, and \$17 @ \$18 for standard brands of Gray Forge, at which figures there should be a fair margin to producers.

Manufactured Iron.—The year closes with a more hopeful feeling than has been experienced for many months past, although as yet there has been little or no improvement in prices. The volume of business is increasing, however, and with that prices must follow. Nominally quotations have been the same all the year through, say 1.8¢ for Best Refined Bar Iron, and 2¢ for Plates and Angles, but from shading of from 0.02½¢ to 0.05¢ early in the year cuts were made of a tenth, and even more than that, particularly during the summer months. There has been a gradual recovery, however, and the year will close with sales at about the same prices as were made at the opening, but with a firm market now against a weak and unsettled one then. The demand was very unsatisfactory during the greater portion of the year, and prices cut to a point lower than ever known in the entire history of the trade. All the leading industries that usually furnish business to the rolling mills were in a most depressed condition. Car building, ship building, tank building, besides others of less importance, were doing almost nothing, so that the demand for Finished Iron was slow and uncertain and at most unsatisfactory prices. During September business began to look up a little, large orders for Plate and Skelp Iron were entered, and for a while it seemed as though prices would stiffen up firm to quoted rates. A slight hesitancy began to be felt late in October, and again prices dropped back into the old rut, and what were considered desirable orders had to be taken at about 1.7¢ for Bars and 1.9¢ @ 1.95¢, delivered, for Plates and Angles. Within the past two days prices have again stiffened up, and a considerable amount of business has been taken at a slight improvement on the figures above quoted, with a reasonable certainty that 1.8¢ @ 2¢ or more will be firm quotations after this month.

The outlook for 1886 is decidedly encouraging. Almost every industry in the land that calls for Finished Iron shows signs of renewed activity. Nothing in the nature of "a boom," simply more business, at slightly better prices. Bridge building promises to furnish a great deal of work, about 20,000 tons being under negotiation at the present time. Elevated railway work during the spring will require from 40,000 to 60,000 tons. The Pipe mills are likely to be large consumers of Skelp Iron, and the Tank builders are also figuring on a considerable amount of business in their line. Car building and Locomotive building is improving, and will undoubtedly be in much better condition than during the past 12 months. Ship building which has been virtually suspended for some time begins to show signs of improvement. The William Cramp's Sons have just taken a contract for a large Iron steamship to cost \$500,000, and other work of the same character is said to be near at hand. Taking all these facts into consideration, therefore, and with the certainty of improvement in the many minor industries, which count heavily in the aggregate, it seems entirely safe to predict a season of moderate prosperity during 1886—not because of any extraordinary demand from any particular source, but because of a return to what should be a normal condition, viz., a well-distributed demand fairly well up to our capacity for production and at fair average prices.

Steel Rails.—The year opened with quotations at about \$27, f.o.b. cars at mill, which

price was maintained for seven months, with variations of about 50¢ ¾ ton, although in isolated cases \$26, and in one instance \$25.50, is said to have been accepted. The Long Branch agreement, to restrict the output during 1886 to 775,000 tons, was concluded about the last of August, and appears to have worked like a charm. Orders that have been hanging over the market for lower prices were immediately placed, and from that date to the present business has been so large, on steadily advancing prices, that the allotment was increased to 1,000,000 tons. Prices are now \$34 @ \$35 at mill, and could probably be increased to higher figures, but there is a disposition on the part of manufacturers to avoid any further advance, unless forced to it by circumstances beyond their control. Latest sales reported for 5000-ton lots were at \$34 at mill; smaller quantities \$34.50 @ \$35. The mills are amply supplied with orders for some time to come, and will doubtless be able to run full during the greater portion of the year, probably full the year through.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., December 23, 1885.

The next couple of weeks will probably be taken up largely by our merchants and manufacturers in taking stock and making settlements, and there is not likely to be much business during the time in question. The outlook, however, is generally considered favorable for a good spring trade. One of our best posted railroad officials expresses the belief that general business in 1886 will exceed that of 1885. He says that the railroads have been running everything very close for several years, and that they will now be obliged to build new Cars and Locomotives and otherwise improve their general equipment. Some of the railroads made a good stroke in contracting for Steel Rails prior to the recent advance, and, as the indications at present point to higher prices for all kinds of Railway Supplies, an improved demand is looked for early in the year. The labor situation remains unchanged. The nailers are still out, and there is not much prospect of the strike being brought to an early close. The scale of the steel-workers has been prepared, and will be presented to the manufacturers between now and the 15th prox. It is not known whether an advance will be asked for or not, but it is probable that it will, as the impression prevails among the workers that the manufacturers are able to pay an advance for labor. The coal-miners' strike has not yet been fully settled, but it has been in a very weakly condition for some time past; a good many of the strikers have resumed work, and it is confidently expected that the remainder will be ready to go in before long. General Negley, our Representative in Congress, will ask for an appropriation for the construction of another dam in the Ohio River, similar to the one recently completed at Davis Island.

Iron Ore.—There is a continued good demand for desirable Ores, as in addition to the furnaces now in blast, the number of which has been increased considerably of late, others are making preparations and will be started up as soon as they can be got ready. Advices from Cleveland report continued activity in Lake Ores, the supply of which in first hands is steadily being reduced. The Republic Co., it is said, are refusing to sell any large lots, their policy being to divide up what stock they have left in small lots among regular customers. The position of the Ore trade has been very much changed within a few months, and it was generally unexpected. At this time last year it was in a most depressed condition.

Pig Iron.—Business has been less active the past week, but this was to be expected. A good many consumers have been anticipating future wants, apprehensive of higher prices next year, but owing to the sharp advance there is not so much inquiry. Consumers claim that as yet the products have not responded much to the enhanced cost of the raw article, and this causes some apprehension, and not without good reason, for it is about as certain as anything can be that if the latter do not advance the former must decline. It is true the cost of production has been increased by the advance in Ores, with probability of a higher price for Coke and advanced rail freights in the near future, but it is very evident that mill owners cannot afford to pay any more for Pig Iron unless they can get more for Finished Iron; and, taking present prices as a basis, the former is bringing much more relatively than the latter. The production has been increased considerably the past few weeks, and we hear of quite a number of furnaces that are being put in condition to start up in January. Quotations may be fairly made as follows:

No. 1 Neutral Mill.....	\$15.75 @ \$16.00, 4 mos.
No. 2 Neutral Mill.....	15.00 @ 15.25, 4 "
All-Ord Mill.....	17.50 @ 18.00, 4 "
White and Mottled.....	14.25 @ 14.75, 4 "
No. 1 Foundry.....	17.75 @ 18.00, 4 "
No. 2 Foundry.....	16.25 @ 16.75, 4 "
Cold-Blast Charcoal.....	20.00 @ 20.50, 4 "
Bessemer Iron.....	20.00 @ 21.00, 4 "

There have been no sales of Bessemer Iron reported recently, and it is difficult to give reliable quotations in consequence. A number of furnaces, including that of Moorhead, McLean & Co., of this city, will be started upon Bessemer within a week or two.

Muck Bar.—There have been no sales reported of late, in the absence of which we quote nominally at \$26.50 @ \$27, cash. At

prices quoted Muck is cheaper relatively than Pig Iron, and certainly promises a better return to those of a speculative turn.

Manufactured Iron.—There is a good deal of inquiry, and it is evident that buyers are apprehensive of higher prices. Manufacturers, while still supplying immediate wants of regular customers at quoted rates, are refusing to make contracts for future delivery except at an advance. It is very evident that if the enhanced price of the raw material is maintained Finished Iron must go higher. Some manufacturers are now refusing to sell at bottom rates of a month ago, but a large buyer remarked to your correspondent within a day or two that he had not yet been obliged to pay any advance. We continue to quote Bars at 1.65¢ @ 1.75¢ rates, 60 days, 2¢ off for cash, for well-assorted lots. Some mills are refusing to sell below outside quotation.

Nails.—The Nail trade continues very quiet and there is not likely to be any material change until the spring business opens up. There is no demand except in a jobbing way, and the production in the West is now pretty well up to the consumption. The impression generally prevails that the manufacturers, as the matter now stands, have the best of it. The next monthly meeting of the Western Association takes place in January at Cincinnati.

Wrought-Iron Pipe.—There is not so much new business, yet the Pipe mills are all busy, and likely to be so for some time to come. Prices remain unchanged. Discounts on Black Butt-Welded Pipe in carlots and upward, 45 %; less than a carload, 42½ %; do. Galvanized, in carlots and upward, 35 %; less, 32½ %; Black Lap-Welded, in carlots, 62½ %; less than a carlot, 60 %; do. Galvanized, 45 % in carload lots, and 42½ % for less. Boiler Tubes, 55 % off regular list. Two-inch Oil-Well Tubing, 13¢ per foot, net; 5½-inch Oil-Well Casing, 40¢, net; 8-inch Drive-Pipe, \$1.30, net.

Old Rails.—The market for Old Iron Rails continues firm, with light offerings and a light supply, and in the absence of sales we quote at \$23.50 @ \$24. Old Steel Rails selling at from \$19 to \$21, according to lengths.

Steel.—There is a fair degree of activity, and prices steady as quoted: Best brands Refined Cast Steel, 8½¢; do. Crucible Machinery, 4½¢ @ 4¾¢; Open Hearth and Bessemer, 2½¢ @ 3¢; Nail Slabs quoted at \$31 @ \$32, and Bessemer Blooms, \$33 @ \$34.

Railway Track Supplies.—Prices are firmer, in sympathy with the enhanced cost of Iron, and an increased demand is looked for early in the new year. Spikes, 2.25¢, 30 days, delivered; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2.75¢ @ 2.85¢.

Steel Rails.—There has not been so much inquiry of late, but mills are oversold and prices are steady at \$35 @ \$35.50, cash, at mill, for Heavy Sections.

Old Material.—There has not been so much inquiry the past week, but prices are steady. We can report sales of No. 1 Wrought at \$18 ¾ net ton; Old Car Axles, \$23; Axle Turnings, \$14; Cast Borings, \$11.50 @ \$12, gross; Railroad Cast Scrap, \$14; Old Wheels, \$16.50 @ \$17, gross; Mixed Scrap Steel, \$17 @ \$17.50, gross ton.

Window Glass.—There is no improvement to note, and not likely to be until spring trade opens up. Manufacturers' discounts remain unchanged as follows: Single Strength, 75 @ 75 and 5 %; Double Strength, 75 @ 75 and 10 %.

Coke.—About 90 % of the ovens are in operation and are working six days in the week. Prices have been fixed for January and are the same as for December—\$1.20 ¾ ton on cars at ovens. The consumption has increased materially within the past 60 days, and is likely to be still further increased next month.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts., CHATTANOOGA, December 23, 1885.

The general trade outlook at the present time is certainly very encouraging compared with what it was at the close of 1884. If exact comparative figures of the two periods could be given, 1885 would present a very gratifying increase in every line of manufacture. New enterprises have sprung up on every side, backed by abundant capital, showing clearly that moneyed men have faith in the resources and future prosperity of the South.

Pig Iron.—There has been no further advance in price as yet, but the feeling among producers is firm and conservative, with every prospect that the price will be maintained and even advanced early in the year. There is no exertion made by the furnacemen to force sales; in fact, there is no necessity for so doing. At least two-thirds of the present offerings are declined, and yet the sales are sufficient to keep their output well sold ahead. All the furnaces may now be said to be making some money on their products. Neither Ores, labor, Coke nor freights have advanced, nor are they likely to do so for some time to come, and any advance in the price of Pig is so much net profit to the producer. A rather significant feature of the present Iron situation of the South is that quite large quantities of stocks of some of the furnace plants have lately changed hands at a large advance at what they were held some three to six months ago. This advance has been in some

instances as much as 200 to 300 % over the prices of last summer. Some of the furnace plants that were commenced on easy stages early in the year will now be pushed to completion as fast as practical economy will dictate. Sales of round lots of Gray Forge have been made during the past week at \$13.25 @ \$13.75, which is a fair indication of the condition of the market. There appears to be much more inquiry at present for this grade of Iron than for foundry grades. Up to the present time the West has been a favorite outlet for this grade, although the East is getting large shipments on contracts previously made. The average amount now moving in this direction aggregates about 1500 tons per week.

Lumber.—The indications are that this article is simply on a boom and likely to continue so. The shipments last season were more than double that of any previous season, but this season will more than double the last if present movements are maintained. The South is taking a great deal, owing to the amount of building that is being done, while the contracts to Northern points are much greater than ever.

Marble.—This article is again coming quite prominently to the front, and several quarries have recently been opened, with good prospects of selling all they can get out. For a few years past Marble has been quite a drug in the market, and several quarries were closed for want of profit in raising it, but recently there appears to have been quite an unusual demand for the article, and certain capitalists have bought up a number of quarries and are opening them up and shipping to several Northern cities. The mill at this place has always had an abundance of orders for table tops, wash-stands, soda fountains, &c., to keep them running continuously, and, in fact, have been obliged to refuse a large amount of work that has been offered them.

Scrap and Old Rails.—Wrought Scrap is quiet, and but little offering; in fact, there is not much to offer, while Old Rails are simply out of the market, as none are to be had and quotations would only be nominal.

Birmingham.

BIRMINGHAM, Ala., December 28, 1885.

It may be because of conditions peculiar to the Iron centers of the South, but in a business way this has been a fairly cheerful holiday season here. All round an average volume of business, for the season, has been done, while the lines that the holidays help most seem to have done rather better this year than usual, if anything. In certain other portions of the State—agricultural districts exclusively—it may be that things are as they are represented to be by farmers, merchants and druggists—almost as blue as they have been at the close of the year any time for the last decade.

Pig Iron.—The foundry and machine shop demand having almost stopped for the holidays, and other trade fallen off measurably, there has been no great volume of sales at the furnaces in this district for the last week, but such transactions as there have been were quite satisfactory to the manufacturers. Gray Forge Iron has sold as high as \$13.25, with every assurance of good prices for the future, in spite of the much larger number of furnaces in blast since the 1st of November. The workings of the furnaces, as a rule, are also satisfactory. One furnace with a nominal average capacity of 75 tons a day is making from 90 tons a day up, having run as high as 102 tons one day lately. Another pleasing thing is that the curiosity about Birmingham has in some cases been too strong for even the Christmas festivities at Northern homes. There has been a fair proportion of prospectors here, and some of them were attracted by the quality of Birmingham Pig Iron they had been using.

Finished Iron.—At the rolling mills it is still almost the story of the last six weeks of higher raw materials and the same old prices. The demand is good, however, and on this point there is sufficient evidence in another addition to the plant that has been determined upon. For some months the puddling furnaces have been on double turn, and then have been able to supply part of the finishing department for only one turn; so now 22 single furnaces are to be added.

Nails.—Are lower—probably the only thing in the whole Iron trade of which this can be said. The Alabama mills now quote them at \$2.45, which price lays them down here at just about what they cost from more distant points, namely, in the neighborhood of \$2.55.

Ore.—There is nothing new to say for Red Ore, and not likely to be for some time, as the heaviest contractors in the district have sold their product for five years ahead to furnaces in the Chattanooga district. One of the railroads, probably because of these contracts, is manifesting a good deal of interest in the development of another property near Birmingham, most of whose product will most likely be sold to furnaces in this district.

Coal and Coke.—The Coal and Coke market is just about what it was a week ago, with a little allowance, possibly, to be made for Grate Coals on account of a remarkable spell of warm weather.

Yellow Pine Lumber.—Reports come indirectly from the mills below here of a

little better price for the Yellow Pine Lumber they are shipping North and West. The local demand, however, has begun to show the effect of winter, and the market is rather weaker.

Cincinnati.

DECEMBER 28, 1885.

Pig Iron.—A more active market in the past week, consumers wishing to avail themselves of the present prices for supply through the coming three or six months. The quantities and deliveries asked for have not been fully granted by sellers; it is therefore thought that present prices will not only be fully sustained, but that a further advance in some grades will be realized. It is now almost certain that the many furnaces that have been idle for some months now going in blast will fill up all requirements of consumers, or possibly increase the stocks on hand considerably by the 1st of February, 1886. Quotations on cars here, or less the freight to Cincinnati if orders are filled direct from furnaces:

CHARCOAL FOUNDRY.	
Southern No. 1, 4 mos.	\$18.00 @ \$18.50
Southern No. 2, 4 mos.	17.00 @ 17.50
Hanging Rock, Best No. 1, 4 mos.	19.50 @ 20.50
Hanging Rock, Good No. 1, 4 mos.	19.00 @ 20.00
Hanging Rock, Good No. 2, 4 mos.	18.50 @ 19.50
COKE FOUNDRY.	
Southern No. 1, 4 mos.	18.00 @ 18.50
Southern No. 2, 4 mos.	17.00 @ 17.50
Ohio and West Pennsylvania, No. 1, 4 mos.	17.50 @ 18.00
Ohio and West Pennsylvania, No. 2, 4 mos.	17.00 @ 17.50
SILVER-GRAY SOFTENERS.	
Hanging Rock (Jackson County), No. 1, 4 mos.	18.50 @ 19.00
Hanging Rock (Jackson County), No. 2, 4 mos.	17.50 @ 18.00
Hanging Rock (Jackson County), No. 3, 4 mos.	15.50 @ 16.00
Other makes and grades.	15.00 @ 17.00
CAR WHEEL.	
Hanging Rock Cold-Blast, 4 mos.	25.00 @ 26.50
Hanging Rock Warm-Blast, 4 mos.	19.00 @ 20.00
Southern Standard Warm-Blast, 4 mos.	17.50 @ 19.00
Georgia Standard Cold-Blast, 4 mos.	23.00 @ 25.00
Georgia Standard Cold-Blast, 4 mos.	25.00 @ 26.50
FORGE.	
Stonewall and Coke.	14.50 @ 15.50
Charcoal.	17.00 @ 20.00
SCRAP.	
Rails, cash.	19.00 @ 19.50
Wheels, cash.	15.50 @ 16.00
Wrought, 100 lb, cash.	.65 @ .75
Cast, 100 lb, cash.	.35 @ .55
50¢ per ton discount for cash from quotations on time.	

Louisville.

W. B. BELKNAP & Co., Louisville, under date of December 28, report as follows: The close of the year, instead of bringing with it a falling off in trade, keeps up a good showing. There is enough desire to anticipate wants for January on the part of those able to read the signs of the future and to profit thereby—to take up the slack, so to speak. A good many buyers have come to town to buy holiday goods, and have ended by laying in staples for shipment in the next month. A strong advance in Wire and the recall of outstanding quotations on almost all lines has gone to give a good deal of backbone to the movement for better prices.

Bar Iron.—Those houses which were selling below the legitimate market have advanced their prices in some cases as much as \$3 @ \$4 per ton. Anxiety to realize on immediate sales at the cut figures have disappeared. This certainly argues an improved demand.

Hoops.—Hoop and Band manufacturers have advanced their prices fully \$2 per ton, and are holding firmly for same.

Sheet.—There is little movement in Sheet, as the season is declining, except that one of the principal manufacturers of Refined Sheets in Pittsburgh has given notice of an advance of 10¢ @ 15¢. It is thought that after the first of the year prices on ordinary grades will experience a reaction.

Nails.—Are holding steadily at the price of a fortnight since. Iron Nails are more plentiful, and the breach between them and Steel has been widening since the price of Steel was fixed; consequently, their consumption is increasing.

Wire.—Of all kinds is very firm and the advance in Barbed Wire easily obtained. The readiness with which the advance is accepted must be a surprise to those who have been making and using lower figures for so long.

The weather is fine and the prospects for a good, big business the first of the year are most encouraging. There are complaints from some sections of lack of money in the country. This is largely, we think, because the farmers refuse to accept current prices for their crops. But the same crop will buy them a much larger stock of supplies now than a few years ago when it figured up more handsomely in dollars and cents. Altogether there is little reason to complain unless Congress should disturb compliance by undue agitation. The silver kings have captured a good many of the leading newspapers and have raised a fallacious cry of corporations against the poor man. We may have to pay more dearly for our folly before we get through with it, but it would seem as though there ought to be enough common sense in the country to realize the fact that the poor man does not constitute \$1, and when the people find it out it will be the poor man that will have the 80¢ as usual, and the astute corporation the full measure. The way to protect the poor man is to have a proper standard of values which cannot by any juggling process be used to his disadvantage.

GEORGE H. HULL & Co., of Louisville, report to us as follows, under date of December 29: The sales of Pig Iron have been very small during the past week. The market, however, is just as firm as ever, and we know of no lots of iron that could be bought except at full prices. As noted last

week the majority of Coke furnaces will not book any large orders, and some will not book even carload lots, on account of their already having sold all the Iron they can make for three or four months to come. Other furnaces, although largely sold ahead, will book small orders for short delivery, as they have it to spare, and the Southern furnaces generally seem to be anxious that no further advance in the market should be made at present at least. At the same time, every indication leads to the belief that there will be no decline, and, unless buyers force it by large purchases, there will be no advance, as the furnaces seem to be opposed to it. Under this condition we look for a healthy market, a demand that will take all the furnaces produce, and no advances except substantial ones that will be fully maintained. We quote all grades of Coke Iron the same as last week. Car-Wheel Irons are held higher, and our figures have been revised in accordance with same. We quote as follows, for cash:

PIG IRON.	
Southern Coke, No. 1 Foundry.	\$18.00 @ \$18.50
" " " " " " " "	17.00 @ 17.50
" " " " " " " "	16.50 @ 17.00
Hanging Rock Coke, No. 1 Foundry.	18.00 @ 18.50
Hanging Rock Charcoal, No. 1 Foundry.	19.00 @ 20.00
Southern Charcoal, No. 1 Foundry.	18.00 @ 19.00
Silver Gray, different grades.	16.50 @ 17.00
Southern Coke, No. 1 Mill, Neutral.	16.00 @ 16.50
" " " " " " " "	15.00 @ 15.50
" " " " " " " "	15.50 @ 16.00
Southern Charcoal, No. 1 Mill.	16.50 @ 17.00
White and Mottled, different grades.	13.00 @ 13.50
Southern Car-Wheel, standard brands.	23.00 @ 24.00
Southern Car-Wheel, other brands.	24.00 @ 25.00
Hanging Rock, Cold-blast.	24.00 @ 25.00
" " " " " " " "	18.00 @ 21.00
Old Material.	
The sales of Old Material have been very light, not because of absence of demand, but because holders are holding lots of any magnitude so far above the bids of buyers that only small transactions have been made. Old Rails could be sold readily at \$21, but the holders are asking \$22.50. Wrought and Cast Scrap have advanced about 10¢ per 100 lb, and we revise our quotations accordingly:	
Rails, 100 lb.	\$20.50 @ \$21.50
Wheels, 100 lb.	11.50 @ 15.00
No. 1 Wrought, 100 lb.	.80 @ .85
No. 1 Country Wrought, 100 lb.	.70 @ .75
No. 2 Country Wrought, 100 lb.	.50 @ .60
No. 1 Cast, 100 lb.	.60 @ .65
Boilers, cut, 100 lb.	.40 @ .45
Boilers, uncut, 100 lb.	.40 @ .45
Axles, 100 lb.	.90 @ .95
Flues, Tanks and Sheets, 100 lb.	.25 @ .30
Burned Scrap, 100 lb.	.20 @ .30

St. Louis.

W. H. SHIELDS, 305 Olive street, St. Louis, reports, under date of December 28: Prices here are steadily advancing, and, while furnacemen have great hopes for the future and expect a sharp advance after the 1st, consumers, as a rule, are not over-anxious to buy at the advanced figure. I quote nominally as follows:

CHARCOAL FOUNDRY.	
Missouri.	\$16.00 @ \$18.00
Southern.	18.50 @ 19.50
COAL AND COKE FOUNDRY.	
Missouri.	16.00 @ 18.00
Southern.	17.50 @ 18.50
American Scotch.	19.00 @ 21.00
MILL IRON.	
Missouri.	16.00 @ 17.00
Southern.	16.00 @ 16.50
CAR-WHEEL AND MALLEABLE IRONS.	
Southern.	20.00 @ 24.00
Lake Superior.	20.00 @ 22.00
SCRAP, ETC.	
Old Rails.	20.00 @ 21.00
Old Wheels.	15.00 @ 17.00
Connellsville Coke (East St. Louis).	5.30 @ 5.50

Detroit.

CHARLES HIMROD & Co., dealers in Pig Iron, Detroit, Mich., report, under date of December 28, as follows: Following the heavy selling of a week ago there seems to be a great disinclination to part with any large lots of Iron, the sellers trying to force the buyers to take as little as they can to supply their actual needs, and no quotations are made to outside parties except at a very stiff advance. While there are two or three Charcoal furnaces ready to start up, there are also two or three in our vicinity out of blast. On account of the dull times during the summer they did not think it would be worth the while to run during the winter and made no arrangements for Ore supply, and are now feeling very sore in consequence. The quantity and price of Ore, so far as deals have been made in the West, namely the Chicago market, where Ore can be delivered by cars, point to from 50¢ to \$1 advance on the raw material. This means from \$1 to \$2 higher cost of Iron. The Ore men who have any Ore at all in Cleveland or Ashtabula claim they are able to make nearly their own figures for the little they have left. At present it is a matter of considerable apprehension as to what course the furnaces will pursue from January 1 on. Some of them have taken this as a starting point for naming future prices. There will in all probability be very little buying for the next two or three weeks. There were many opportunities for large sales during the past week, but the prices were not sufficient to warrant the deliveries asked. There was comparatively little movement of Southern Iron, or, in fact, any grade, during this period. We present the following prices on four months time:

Lake Superior Charcoal, Nos. 1, 2 and 3.	\$22.00 @ \$23.00
Lake Superior Charcoal, Nos. 4, 5 and 6.	21.00 @ 22.00
Lake Superior Coke, All Ore.	21.00 @ 22.00
Lake Superior Coke, Cinder Mixed.	21.00 @ 22.00
Standard Ohio Blackband.	19.00 @ 19.50
Southern No. 2.	17.50 @ 18.00
Southern Silvery, Open.	17.00 @ 17.50
Southern Silvery, Close.	17.00 @ 17.50
No. 1 Southern Mill.	17.00 @ 18.00
American Old Iron Rails.	21.00 @ 22.00
Old Wheels.	18.00 @ 19.00

Baltimore.

R. C. HOFFMAN & Co., Pig and Railroad Iron merchants, 21 South Frederick street, write as follows, under date of December 28: We can now report some improvement in the Pig-Iron market, with increased inquiry

and demany for best grades; prices are tending upward. We quote present prices very firm, about as follows:

Baltimore Charcoal Wheel Iron (all grades). \$25.00 @ \$27.00
 Virginia Cold-Blast Wheel Iron. 26.00 @ 27.00
 Anthracite No. 1. 18.00 @ 20.00
 Anthracite No. 2. 17.00 @ 19.00
 Anthracite No. 3. 15.00 @ 17.00
 Anthracite, Mottled and White. 14.00 @ 15.00

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending Dec. 30, 1885:

Hardware.	
Baker Hermann & Co.	Coils, 355
Cutlery, hardware and guns, pkgs., 198	
Brown Bros. & Co.	Spigels, 200
Curley & Bro.	Pieces, 10
Case, 1	Silico spigels, 3ks, 20
Drexel, Morgan & Co.	Pieces, 638
Field, Alfred & Co.	Arms, cs., 55
Middle, 5	Wire rods, coils, 1548
Folsom H. & D.	Wire rods, coils, 4641
Arms, cs., 2	
Fuchs & Lang	Pig, tons, 970
Machinery, cs., 4	Rods, pkgs., 910
Gerard Otto.	Scrap, tons, 188
Rales, 7	Rail crops, tons, 9
Bundles, 232	
Gt. West, Dis. Co.	Ore, tons, 252
Case, 2	Coiled rods, bbls., 216
Lewis Bros. & Co.	
Machinery, cs., 2	
Lockhardt Capt.	
Gun caps, case, 1	
Mer. Dis. Co.	
Arms, case, 1	
Case, 2	
Newton & Shipman	
Spelman, W. B., Jr.	
Case, 13	
Schutte W. & Co.	
Case, 10	
Schovering, Daly & Co.	
Case, 7	
Sheldon Geo. W. & Co.	
Machinery, cs., 2	
Case, 4	
Squires H. C.	
Case, 2	
Taylor, Thos.	
Case, 4	
Vom Cleff & Co.	
Case, 3	
Wiebush, Hilger & Co.	
Cutlery and hdw., cs., 15	
Wierman, E.	
Case, 1	
Witte John G. & Bro.	
Cutlery, cs., 13	
Wright Peter & Sons.	
Machine, parts, 2	
Ma. parts, pkgs., 9	
Metals.	
Baring Bros. & Co.	Zinc oxide, bbls., 100
Cahn H. H.	
Case, 14	
Abbott Jere & Co.	
Case, 192	
Baring Bros. & Co.	Wire rods, coils, 2232
Field, Alfred & Co.	Coils, 219
Case, 119	
Rivet iron, coils, 1102	
Bars and bbls., 1008	
Coddington T. B. & Co.	Sheet, bbls., 355
Crocker Bros.	Pig, tons, 220
Case, 220	
Ferro iron, lot, 1	
Ferro iron, coils, 118	
Ferro iron, tons, 399	
Downing R. F. & Co.	Girders, 87
Girders, 87	
Geshenheimer & Co.	Sheet, bbls., 1449
Case, 39	
Heyn Alfred	Rods, pkgs., 263
Heney A. T.	Pig tons, 100

The imports at this port of Cutlery, Hardware and Metals for the week ended December 25 were as follows:	
Quantity.	Value.
Anvils.	20 \$163
Brass goods.	61 5,892
Bronzes.	21 1,649
Chain and anchors.	41 2,418
Clocks.	30 3,919
Copper.	111
Cutlery.	131 38,282
Guns.	55 11,367
Hardware.	13 1,413
Iron, pig, tons.	1,592 40,511
Iron, sheet, tons.	18 1,409
Iron tubes.	109 148
Iron, other, tons.	968 30,559
Railroad bars.	3,148 2,006
Leads, pigs.	2,501 7,720
Machinery.	66 4,112
Metal goods.	338 20,499
Nails.	6 345
Needles.	5 2,398
Nickel.	6 9,001
Old metal.	26 1,849
Plated ware.	13 1,562
Pins.	532 5,262
Plumbago.	29 2,379
Regulus antimony.	20 5,636
Saddlery.	20 5,335
Steel.	59,535 38,244
Tin, bbls.	31,289 115,438
Tin, 8555 slabs; 10.	953,232 7,924
Wire.	39 7,624
Zinc, bbls.	27,611 1,775
Zinc oxide.	200 1,163

The comparison for two years since January 1 is as follows:

	51 weeks of 1885, time 1884.	Same of 1884, time 1883.
Cutlery, pkgs.	4,833	5,112
Hardware, pkgs.	12	729
Iron, R. R. bars.	10,708	9,422
Lead, pigs.	41,367	42,194
Steel, pkgs.	2,278,908	1,866,506
Tin, bbls.	1,572,315	1,573,178
Tin slabs, b.	20,547,961	24,794,534

Exports.

The following list embraces the Exports of Hardware, Machinery, Iron, Metals, &c., from the Port of New York, for the week ending December 29, 1885:

Danish West Indies.		Amsterdam.	
	Quan. Val.		Quan. Val.
Nails, kegs.	10 39	Pumps, pkgs.	8 423
Mf. iron, pkgs.	22 100	Hdw., pkgs.	47 547
Dutch West Indies.		Liverpool.	
Nails, case.	1 14	Hdw., cs.	50 1,349
Mach'y, case.	1 8	Guns, cs.	3 210
Bremen.		Rifles, cs.	4 347
Pumps, pkgs.	7 162	Shears, case.	1 56
Ag. imp. pkgs.	10 780	Clocks, pkgs.	162 2,921
Hamburg.		Sew. ma. cs.	583 12,154
Agate-ware, cs.	4 113	Mach'y, pkgs.	26 3,247
Mach'y, pkgs.	33 4,665	Nails, bxs.	55 110
Pumps, pkgs.	5 291	Steel wire, pkgs.	2 450
Old brass, pkgs.	21 1,037	Antwerp.	
Sew. ma. cs.	267 8,034	Mach'y, pkgs.	7 150
Metal, case.	1 70	Hdw., cs.	81 451
Hdw., cs.	451 6,590	Mf. iron, pkgs.	39 1,030
Clocks, cs.	151 3,028	Bristol.	
Ag. imp. pkgs.	206 4,330	Hdw., cs.	18 302
Firearms, cs.	2 263	Clocks, cs.	51 327
Saws, case.	1 30	Ag. imp. pkgs.	5 50
Mf. iron, pkgs.	15 377	Mf. iron, pkgs.	13 338
Tinware, cs.	40 730	London.	
Knitting machines, cs.	5 580	Sew. ma. cs.	255 11,201
Copenhagen.		Mach'y, pkgs.	1 30
Hdw., pkgs.	10 228	Clocks, cs.	179 5,820
Clocks, cs.	6 171		

Trade Report.

General Hardware.

With the quiet incident to the holiday season and the closing year there is not a heavy volume of business doing. Some houses, however, whose dealings are principally with the retail trade, report that orders, if not large, continue unexpectedly frequent, and refer to the demand as being more than fair, considering the season. The condition of prices to which we have before referred continues, there being a decided tendency, especially in Heavy Hardware and some lines on which the prices, owing to excessive competition or other causes, were unprofitably low, toward firmer and in some cases advanced quotations.

Altogether the year closes in a much more satisfactory condition than prevailed at its opening, and confident expectations are expressed of a good trade the coming season. The improved tone of the market as regards prices is also recognized, but it must be remembered that many lines of goods are as yet unchanged and still characterized by weakness, and it remains to be seen whether the improvement that has taken place in other lines will also take place in these. The general course of prices will depend in a great degree upon the conservatism and wisdom of the manufacturers, many of whom, there is reason to hope, are tired of forcing goods on the market at figures which afford little or no profit. Firmness on their part in maintaining prices, and moderation in production, will materially improve the situation and help to bring that better condition of things which there are some indications. And so, congratulating our readers on the improved outlook, and expressing the hope that the past season's business may make a satisfactory exhibit, we wish them, whether manufacturers or merchants, a happy and prosperous new year.

NAILS.

The market has been quiet during the week and has shown a downward tendency. There have been sales of carload lots at \$2.25 for Iron Nails, to close out a lot. Store quotations are \$2.40 to \$2.50. The situation is one which calls for careful scrutiny and does not quite justify the belief apparently held by many buyers that Nails must drop back to the old figures. Statistically the situation is strong. The Western mills, it is true, are able to take care of the small local demand, and should the works now idle start up the supply would rapidly become ample. On the other hand, the spring trade is likely to call for an exceptionally heavy quantity of Nails, because consumers are absolutely bare of them. This consideration has considerable weight with the stronger Eastern mills, who will probably follow the policy of piling up rather than selling. Raw materials, too, have advanced and show much firmness now. Besides, the Eastern Pennsylvania mills have decided upon a four weeks' stoppage between the 1st of January and the 1st of March, and it is possible that the New England mills will join in this movement. On the other hand, the capacity is very large and the dull period before the opening of the spring trade may bring out a few anxious sellers. The labor question in the Eastern mills seems to be adjusting itself to the old basis quietly, and the danger of stoppage from that cause is more remote. Then the Wire Nail has undoubtedly been making headway quite rapidly. Taking all the elements in the situation together as revealed now, the future for the Nail trade is by no means as black as many would paint it. The early future may bring bargains which shrewd buyers will do well to avail themselves of.

BARB WIRE.

The market has advanced further, 4.62½ cents being the prevailing quotation for carload lots of Galvanized Four-Point Barb Wire, although we hear of an isolated sale at Boston at a concession. The market is firm and sellers decline generally to enter orders beyond January shipment. For small lots 5 cents is asked, and for 3-ton lots, 4.75 cents. At a meeting of the Plain Wire manufacturers in this city yesterday Plain Bright Wire for barbing was advanced from 3.15 to 3.30 cents, with the usual addition for Galvanized Wire.

TACKS.

An advance in Tacks, taking effect January 1, will be announced on that date. The circulars are not yet distributed to the trade, but it is understood that on leading goods the advance will be of about 10 per cent., some lines, however, remaining unchanged. It is intimated that the following are the new prices of some of the principal goods: American Iron Carpet Tacks, dis. 55¢; Steel Carpet Tacks, dis. 50¢; Swedes Iron Tacks, Carpet Tacks and Upholsterers Tacks, dis. 50¢; American Iron Cut Tacks, dis. 50¢; Common and Patent Brads, dis. 40¢; Cigar-Box Nails, Finishing Nails, Gimp Tacks, &c., dis. 45¢. A new Shoe Finders' list and a new list of Lining and Saddle Nails are also to be issued. The cash discounts remain the same as before, 10 per cent. being given for cash on or before the 20th of the month following the month of shipment, with an additional 2 per cent. for cash if the invoice is paid on or before the 6th of the month following the month of shipment. It is also understood that the guarantee of prices made to custom-

ers in December last is to be withdrawn. The general condition of the Tack market is regarded as satisfactory, and this advance is taken as an indication of the strength of the combination and their control of prices.

LOCKS.

There has been more than the usual delay on the part of the manufacturers in issuing their revised lists embodying the action to which we referred in our last issue. The outside makers have also for the most part deferred any public announcement of the course they will pursue, but intimations are made in a quiet way that many of them will adhere to their former policy of shading association prices. The important reduction in these prices, as announced last week, is, however, referred to by some of the associated manufacturers as limiting the opportunity for outside cutting, and intimations are given that this was one of the reasons for making so radical a change.

As the list of the Mallory-Wheeler Co., which we presented our readers in our last issue, while of very great interest, was necessarily incomplete, we print in the following columns the complete Lock list of the Russell & Erwin Mfg. Co., which, it will be observed, has been revised throughout, the list of their Real Bronze Goods having been changed so as to make it subject to the same discount as the regular line. The trade will appreciate the convenience that will result from this alteration. The list as given, it will be borne in mind, except where otherwise stated, is subject to a discount of 50 per cent., with 2 per cent. additional for cash within 30 days from date of invoice.

The Trenton Lock and Hardware Co., of Trenton, N. J., give notice to the Hardware trade that on and after January 1, 1886, they will adopt new lists and discounts to conform to those adopted by the Lock Association, as noted in our last issue, and they withdraw all former lists, discounts and special rates on their line of Locks, Latches, Knobs and Escutcheons. Referring to the fact that they were awarded a silver medal by the Novelty Exhibition held in Philadelphia this fall, they allude to their purpose to maintain the quality of their goods, which they intimate that they will furnish at the lowest market rates.

MISCELLANEOUS PRICES.

The manufacturers of Axes are still in conference with reference to measures regulating prices, and the hope is expressed that the negotiations will result satisfactorily. However this may be, the general impression is that the Axe market is characterized by much more firmness than for some time, and some well-informed observers who note what they consider a general tendency toward better prices in Hardware, and especially in Heavy Hardware, express the opinion that Axes will before long be held at higher figures than at present. William Mann, Jr., & Co., Lewistown, Pa., have issued a circular already announcing prices about 50 cents higher than their former quotations, and it is thought that other manufacturers, without having made formal announcement of change of price, are withdrawing recent quotations and holding their goods more firmly.

The manufacturers of Tinware, Stamped, Japanned and Pieced, are holding the goods higher, with a withdrawal of the extremely low figures which have recently prevailed. Some concessions are, however, still made to careful buyers beyond the regularly announced discounts.

There is considerable irregularity in Bright Wire Goods, and we hear of purchases by retailers through the country at prices which are a material concession beyond the nominal figures.

No change is as yet announced in Screws, but the opinion, to which we have before referred—that these goods will soon be higher—is still held, and it is thought by well-informed merchants that early in January an advance will be announced. There has been a conference among the leading manufacturers with reference to some such action, and, while at our last advices there was not entire unanimity of view as to some matters, it is thought likely that an advance by some, if not all, of the manufacturers may be expected at an early day.

There is an evident tendency in Hoes, Forks, Rakes, &c., toward higher figures, most of the manufacturers having withdrawn previous low quotations, and some of them making their best price to the largest buyers about 10 per cent. advance upon the figures at which their goods were recently sold. A meeting of the manufacturers is reported to be held this week, and it is intimated as probable that some united action may be taken with reference to prices.

The Bright Wire Goods Association held a meeting in New Haven on the 29th inst. The present price, adopted by the manufacturers October 1, viz., 70 and 5, and 10 per cent. for cash in 30 days, was reaffirmed.

In view of the scarcity of the German Acme Skate, the announcement made on page 30 by H. & G. E. Knight, 21 and 27 North Fifth street, Philadelphia, will be of interest. They state that they have 1000 pairs of these Skates, No. 5, assorted 8 to 12 inches, which they offer to the trade at 85 cents, per pair, net.

The J. Barton Smith Co., Philadelphia, manufacturers of Patent Screw Tang Files and Rasps, announce to the trade that owing to late advances in Steel they are obliged to withdraw former quotations on these goods, and name 55 per cent. discount from their

list of December 1 as their selling price. Terms 30 days, net cash, f.o.b. Philadelphia.

By their advertisement on page 35 it will be seen that James Mann & Sons, Buffalo, N. Y., announce an advance in the price of their Heavy Strap Hinges, the discount of which they name as 70 per cent., and to the quality of which they allude.

The Duggan-Parker Hardware Mfg. Co., St. Louis, Mo., issue a circular relating to Boggs's Patent Self-Closing Butts, of which we gave a description in a recent issue. Of these Butts they are making the following sizes, the list prices of which are subject to a discount of 50 per cent.:

Size. Price. Size. Price.
3 x 2½ \$1.80 3½ x 2½ \$2.50
3 x 3 1.95 4 x 4 3.25
3 x 3½ 2.10 4½ x 4½ 4.00
3½ x 4 2.25 5 x 5 5.50

Of this Butt they advise us that they are making a special feature, and for its manufacture they are obliged to increase their capacity.

The Wire Goods Co., Worcester, Mass., issue in the form of an extra sheet to be inserted in their catalogue the list, with illustration, of their Adjustable Towel Bracket. The different styles in which this article is made and the list prices are given below, on which a discount of 60 and 10 per cent. is announced:

No. 82, Brass, with Black Enamelled Base.
Inch 14 16 18
Per doz. \$7.00 7.25 7.50
No. 182, Nickel Plated, with Black Enamelled Base.
Inch 14 16 18
Per doz. \$6.00 6.25 6.50
No. 282, Nickel and Tin Finish, with White Wood Base.
Inch 14 16 18
Per doz. \$4.50 4.75 5.00

The Duggan-Parker Hardware Mfg. Co., St. Louis, Mo., announce that by reason of the recent advance in the price of raw material they are compelled to advance the price of their goods and withdraw quotations heretofore made.

ITEMS.

The Simmons Hardware Co., St. Louis, are about to open a sample-room in Chicago which will be devoted to the representation of their very extensive line of Hardware, but where they will carry no stock. It is understood that the premises 81 Lake street have been leased for this purpose and salesmen engaged.

S. A. Haines & Co., finding their quarters at 88 Chambers street insufficient, are removing to 90 Chambers street, which is being appropriately fitted up for their accommodation. They will there carry, it is announced, for the convenience of the trade a stock of goods which will be handled only in full packages.

The Medford Fancy Goods Co. issue a circular announcing that, finding their present place of business inadequate to their wants, they have leased the store 707 Broadway, New York, where they will have increased facilities for displaying and shipping goods. Their factory will be in the immediate neighborhood, and they refer to having introduced new and improved machinery which will enable them to fill their orders with more promptness than in the past and at lower figures.

The Grand Rapids Refrigerator Co., Grand Rapids, Mich., issue an illustrated catalogue and price list of their Leonard Improved Refrigerators and Creameries. They allude to the special features of their Hardwood Refrigerators and explain some of the details of their construction. In their introductory circular to the trade they mention that their goods are sold to only one dealer in a town. The pamphlet is fully illustrated and well printed. Their announcement on page 30, with illustrations of the style and explanation of the construction of their Refrigerators, will be of interest.

Under date December 24, the Moore Mfg. Co., 163 and 165 Lake street, Chicago, announce that they have come into possession of the business and good-will of the late firm of S. H. & E. Y. Moore, and that they will continue the manufacture of Hardware specialties, devoting themselves exclusively to that business. These specialties are well known to the trade as including Door Hangers, Rollers, Anti-friction Sash Pulls, Sliding Door Sheaves, Dumb Waiter Pulls, Moore's Differential Pulley Blocks, &c. It is also announced that early in the new year they will issue a catalogue for 1886.

Thomas Meikle & Co., Louisville, Ky., issue a pamphlet describing the Bluegrass Sulky Plow, to the special features and advantages of which they allude. George C. Kelly, Birmingham, Ala., issues an illustrated and descriptive catalogue of Hardware, showing a selection of standard goods in the general building and house furnishing lines, also Mechanics' Tools and Cutlery. It is a substantial pamphlet of more than 200 pages, fully illustrated and conveniently arranged, and published by T. W. Root, Detroit, Mich.

Samuel A. Haines, 90 Chambers street, has been appointed by the Hospital Saturday and Sunday Association of New York City to receive the subscriptions of the Iron and Hardware trades for the benefit of the hospitals of the association. The claims of this most commendable charity, by which during the past year 9000 free patients were cared for, and other work carried on at a necessarily large expense, will be recognized, and it is hoped that the Hardware and Iron trades may be represented by substantial contributions.

Jones & Merritt, manufacturers of Hollow Ware, Auburn, N. Y., desire us to cor-

rect the report alluded to in our last issue concerning a change in the ownership of their business, and we take pleasure in giving it their emphatic contradiction.

We take pleasure in laying before our readers the following announcement of a new Hardware firm, both of whose members are widely known to the trade:

New York, December 31, 1885.

To the Trade: The undersigned respectfully announce that they have associated themselves under the firm name of Bolmes & Coffin, for the purpose of representing for direct shipment to the trade manufacturers of Hardware and other lines usually sold by Hardware dealers. In the next issue of *The Iron Age* we shall be able to announce the location of our office; for the present all communications will reach us at No. 79 Chambers street. Correspondence solicited.

EDWARD A. BOLMES,
GEORGE G. COFFIN.

Our readers will observe among the Hardware Novelties in this issue a description of Pope's Farrier Knives, for which Wiebusch & Hilger, 84 and 86 Chambers street, New York, have made arrangements for the sole agency, beginning with January 1, 1886.

The Tucker & Dorsey Mfg. Co., Indianapolis, Ind., will shortly after the holidays introduce to the Hardware trade a new Children's Wagon, which is described as embodying several new features and as being very durable in its construction.

E. C. Atkins & Co., Indianapolis, Ind., have issued a new catalogue illustrating, with list prices, their line of Saws, Saw Tools, Mill Specialties, &c. In presenting it they call special attention to their Band Saws for mills, for the manufacture of which they have recently fitted up their works with improved machinery, and to the quality of these goods they call attention. The list in hand is tastefully printed, somewhat larger than their last issue, and contains the most recent additions to their line.

S. A. Haines & Co., 90 Chambers street, are representing the Dille & McGuire Mfg. Co., of Richmond, Ind., manufacturers of the Richmond Star Lawn Mower, which, it is intimated, they will offer prominently in this market. The style of this Lawn Mower and some of its special features are illustrated in their advertisement on page 12. A new catalogue of this Mower has been issued explaining its construction, giving list prices and some testimonials from merchants and others who are familiar with the machines.

The Pierce Hardware Co., Rocky Hill, Conn., expect soon to make additions to their catalogue in the line of Hollow-ware, the branch of goods which they are now making comprising Gravity Blind Hinges, Grindstone Fixtures, Barn Door Hangers, Well Wheels, Cast-Iron Hooks, &c.

The following fair and intelligent view of the Ammunition situation, which was unavoidably omitted in our presentation of the subject last week, will be read with interest:

We think the arrangement between the Ammunition Manufacturers' Association and the trade in this country is an improvement on previous plans, and has been accepted as such generally by the largest dealers. In fact, the reckless competition and cutting of prices by some in the trade for several months past made some such arrangement a necessity. While the plan in some of its details is not satisfactory to certain interests, it is hardly possible to adopt a plan to regulate the sale of Ammunition and to secure a moderate profit to all dealers that would be absolutely satisfactory to every interest concerned. We have accepted it, and propose to abide by it as long as we are bound by it, believing that such amendments will be from time to time adapted as the working of the plan may indicate as necessary. The maintenance of this or any other similar arrangement depends upon its being strictly observed in good faith by all the contracting parties.

JOHN WILSON, SHEFFIELD, ENGLAND.

It will doubtless be interesting to many of our readers to learn that this celebrated firm, which dates from 1750 and has a wide reputation for its manufactures, has just added to the firm a junior partner, thus wisely making provision for vigorously carrying on its special manufactures on the same lines that have hitherto secured to the firm such satisfactory results. The new partner is the son of Edward Ridgway, who has been actively connected with the business since 1833, and who had the advantage of serving under the personal and immediate direction of the original John Wilson for 11 years prior to that gentleman's decease. In 1871 Mr. Ridgway's son, E. F. Ridgway, was taken into the establishment, with the view of his ultimately succeeding to the management, and for the more efficiently fitting him for this important position he was put through a thorough practical training in each department of the business, by which he acquired a well-grounded knowledge of steel, forging, the hardening and tempering processes, grinding and other and diversified details. The firm now consists of Thomas Wilson, son of the late John Wilson, Edward Ridgway and Edward Frederic Ridgway, by whom the business is carried on under the old style of "John Wilson." Butchers' Knives, Butchers' Steels and Shoe Knives, as our readers are aware, are the specialties of the firm, and find a market in the United States, the Australian Colonies and many other parts of the commercial world. With ample resources, long experience, vigorous and enterprising management, the house announces its ambition to maintain its well-earned prestige.

Russell & Erwin Mfg. Co.'s Revised Lock List.

December 18, 1885.

No. of Lock.	Price per doz.	No. of Lock.	Price per doz.	No. of Lock.	Price per doz.
00004	\$5.25	106	35.50	10801	6.25
00005	3.75	107	29.00	10802	8.00
00006	5.25	R 108	31.50	10803	8.00
00007	8.25	R 109	24.00	806	9.00
00008	5.50	2404	4.25	806	10.25
00009	5.00	2411	5.25	807	12.00
00010	5.00	2411½	5.25	810	11.00
00011	6.25	2412	6.25	811	12.50
00012	9.75	02424	6.25	812	14.50
00013	7.50	245	4.00	813	18.00
00014	11.00	0245	5.00	815	5.00
00015	6.00	0247	7.40	10816	6.25
00016	9.50	0250	13.50	10817	5.50
00017	6.15	0250½	2.45	821	6.75
00018	8.00	251½	4.00	10821	6.75
00019	9.00	253	40.00	822	9.00
00020	11.40	1255	4.50	10822	9.00
00021	40.00	0255	5.00	823	9.75
00022	27.50	10290	6.25	827	13.50
00023	21.50	2604½	6.25	830	12.00
00024	5.50	261	8.50	831	13.50
00025	2.00	10261	5.00	10861	16.50
00026	3.75	261½	9.75	833	20.00
00027	8.75	261½	5.75	885	5.50
00028	4.75	10262	7.00	10886	6.75
00029	5.50	263	9.25	10887	9.00
00030	14.50	12593	10.00	1300	3.25
00031	15.50	264	7.00	8504	5.50
00032	15.50	265	10.50	851	4.25
00033	16.50	270	8.00	8514	4.50
00034	21.50	10270	8.00	0855	4.15
00035	22.50	371	11.50	10856	3.75
00036	17.25	10271	13.50	8904	11.00
00037	17.25	272	9.25	161	5.00
00038	18.25	10272	9.25	10861	5.00
00039	19.00	273	13.00	1614	5.25
00040	19.00	10273	13.00	1614½	5.25
00041	20.00	285	12.75	822	5.75
00042	20.00	290	16.25	10863	5.75
00043	20.00	300	3.75	1624	6.00
00044	25.00	1301	4.75	10824	6.00
00045	25.00	10301	8.25	865	4.50
00046	27.50	10302	9.00	10867	5.75
00047	2.50	10302	9.00	10867	5.75
00048	12.75	1303	6.00	867	6.75
00049	14.00	10303	9.50	10867	6.75
00050	30.00	1304	6.15	861	13.50
00051	30.00	10304	9.50	882	15.00
00052	24.00	510	6.00	882	15.00
00053	8.00	311	6.25	884	16.50
00054	9.00	10311	9.75	885	16.50
00055	14.00	1312	7.50	886	18.25
00056	9.00	10312	11.00	1002	5.25
00057	15.00	1313	11.00	1002	7.50
00058	20.00	10313	11.50	1003	7.50
00059	20.00	1314	9.00	1004	8.00
00060	Per set.	1314	12.50	1014	9.00
00061	\$13.50	1014	12.50	1014	9.00
00062	Per set.	1315	14.25	1084	2.50
00063	Per set.	1316	16.00	1084½	2.75
00064	Per set.	1316	16.00	1084½	2.75
00065	Per set.	1317	12.75	1084½	2.75
00066	Per set.	1318	14.00	1183	20.00
00067	Per set.	1319	14.50	1191	24.00
00068	Per set.	1320	15.00	1200	25.00
00069	Per set.	1321	15.50	1201	25.00
00070	Per set.	1322	16.00	1202	25.00
00071	Per set.	1323	16.50	1203	25.00
00072	Per set.	1324	17.00	1204	25.00
00073	Per set.	1325	17.50	1205	25.00
00074	Per set.	1326	18.00	1206	25.00
00075	Per set.	1327	18.50	1207	25.00
00076	Per set.	1328	19.00	1208	25.00
00077	Per set.	1329	19.50	1209	25.00
00078	Per set.	1330	20.00	1210	25.00
00079	Per set.	1331	20.50	1211	25.00
00080	Per set.	1332	21.00	1212	25.00
00081	Per set.	1333	21.50	1213	25.00
00082	Per set.	1334	22.00	1214	25.00
00083	Per set.	1335	22.50	1215	25.00
00084	Per set.	1336	23.00	1216	25.00
00085	Per set.	1337	23.50	1217	25.00
00086	Per set.	1338	24.00	1218	25.00
00087	Per set.	1339	24.50	1219	25.00
00088	Per set.	1340	25.00	1220	25.00
00089	Per set.	1341	25.50	1221	25.00
00090	Per set.	1342	26.00	1222	25.00
00091	Per set.	1343	26.50	1223	25.00
00092	Per set.	1344	27.00	12	

For many years the entire production of the celebrated brand of Swedish iron known as Hoop L has been taken and controlled by Sheffield steel manufacturers, and it has been claimed by them that much of the asserted superiority of Sheffield crucible steel has been due to the use of this iron in its manufacture. Messrs. Miller, Metcalf & Parkin, of Pittsburgh, have just concluded an arrangement for the exclusive right to use this brand in this country for a term of years. Of the purity and special adaptation of this iron to the manufacture of crucible steel there is no doubt, and the right to use it in this country acquired by this firm will at least remove any claim to superiority growing out of its use in England.

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GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.
ESTABLISHED IN 1839.




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Registered March 31, 1874.

Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.
Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

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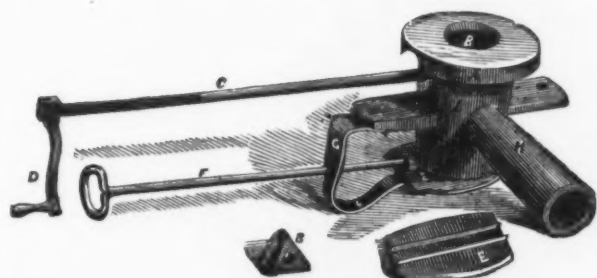
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Surpassing All Others,
AND PRONOUNCED
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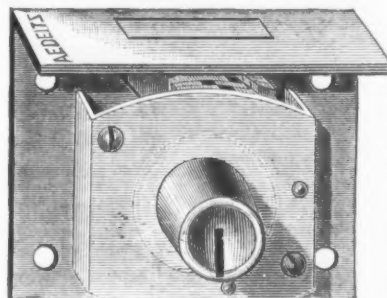
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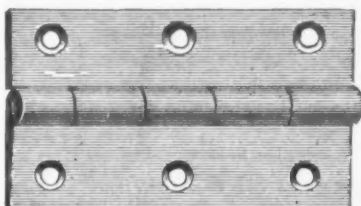
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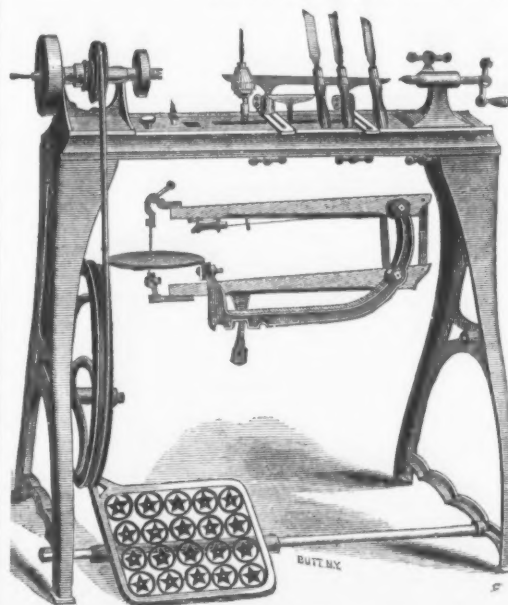
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The Strongest And Safest.
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WE HAVE ADDED THE GOODELL LATHE AND SAW,

As seen in this Cut, to our Line of SCROLL SAW
SUPPLIES for the coming year.



It is by far the best Lathe in
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Lester, Rogers and Cricket Saws.

Another generation of boys is
coming to the front, so that the
demand for these Saws is fast
increasing, and seems likely to
be as large as it was eight years
ago. Dealers can increase their
fall trade by laying in a stock.

Goodell Lathe and Tools... \$10.00.
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Bracket Sets, Nickel Plated,
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Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
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HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
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We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we
manufacture expressly for the shells of Steam Boilers and stamp 50,000 pounds T. S. when
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SIMPLEST AND BEST.
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PURE TURKISH EMERY.
WALPOLE EMERY MILLS,
South Walpole, Mass.

THE WEEK.

The Chicago Canning Co., who have received an order from the French Government for 2,200,000 pounds of canned beef, pride themselves on the fact that they are the first American firm that have been able to secure a contract from the French Government of this character. Australia and South America have heretofore secured all these large contracts, American meat being excluded from competition, owing to the prejudice which has all along existed not only in France, but to a great extent throughout the whole of Europe, against American meat. The contract must be completed within three months.

The receipts of the Brooklyn Bridge for the past year was \$618,914, of which \$537,435 was from the railroad. The entire revenue from tolls since the opening in May, 1883, is \$1,291,681, of which \$1,018,000 was from the railroad. The net receipts for the past year were \$144,345.

Trade papers express undiminished confidence in Mexico and other Spanish-American countries as a promising field for a large variety of small wares now imported from Europe, but which are produced in the United States of the best quality and at the lowest prices. A correspondent in Venezuela speaks of a constant demand for American pumps, base-burning stoves, windmills, horse-powers, cutlery and hardware, most of which are bought in Europe. The same is true of Brazil.

Business depression in South Australia has recently caused a large migration of mechanics to Victoria and New South Wales. Nor is the condition of affairs in New Zealand much better.

The higher prices of sugar in Cuba and the prospects of a very large crop in 1885-86—say of 750,000 tons—have of late caused free purchases of sugar machinery in the United States which is in course of shipment.

The Government of the Argentine Republic has formally accepted the propositions of Mr. Gonzalez for the improvement of the harbor at Buenos Ayres and extension of the interior lines of railway.

Canadian lumbermen complain of an excessive "stumpage" tax, particularly in New Brunswick. While the market in England, to which they are principally shut up, has been growing worse and worse through the competition of Norway woods and the pine and spruce deals of other parts of Canada with the New Brunswick spruce deals, the Government of New Brunswick has been steadily increasing the lumbermen's burdens by increasing the stumpage charged on logs cut on Government lands. These rates are excessive when compared with the value of the material—in most cases equal to 25 per cent. of the value. It is not surprising, under the circumstances, that there was a large falling off in the "cut" last season, and consequently a serious reduction in the provincial exports. Most lumbermen have again reduced their operations for the current season.

Work is progressing actively on all the Cuban sugar plantations, the recent cold weather having ripened the cane. The high grade of juice obtained gives great satisfaction.

John Bigelow, who was recently appointed Assistant United States Treasurer at New York, and confirmed by the Senate, has resigned his office, assigning no reasons.

Sixty thousand rifles manufactured by the Providence Tool Co. have arrived in Constantinople. These rifles will be used to complete the arming of the mobilized forces of Turkey.

Herr Blechroder, of Berlin, has issued a Russian 5 per cent. gold loan, amounting to 20,000,000 rubles, which was subscribed for 10 times over. Herr Housemann, director of the Discount Co., is in London in connection with a Chinese railway loan of £35,000,000. The company propose to supply steel rails from their Dortmund factory.

The Morgan Line steamer El Dorado, arrived at New Orleans from New York, made the fastest time on record between the two ports, viz., 5 days 6 hours and 55 minutes. Some of the coastwise steamers are showing what Americans can do in making high speed.

The business of the New York canals for the season just closed has been an unprofitable one, owing to the West Shore rivalry and excessive elevator charges. Rates have been unprecedentedly low during the whole season of navigation, and the receipts of grain also show a falling off as compared with last year. The following comparisons will be found of interest:

	Grain, bushels.
Total received in New York by canal in 1884.....	87,501,424
Total received in New York by canal in 1885.....	29,429,679
Falling off in 1885.....	6,071,746
Total received in New York by canal in 1880.....	71,089,815
Total received in New York by canal in 1885.....	29,429,679
Decrease in five years.....	41,660,136

While the rate for carrying grain by boat in 1880 averaged about 6 cents per bushel, this year it reaches only an average of 3½ cents. Although the receipts by canal have become reduced, the canal men can boast that

they have carried to this port during the season of navigation (1884) over 9,000,000 bushels of grain more than all the trunk lines centering at this port combined. The boatmen are earnestly in favor of canal enlargement.

The Buenos Ayres Standard of November 10 speaks of the high recuperative powers of the country. The wool season was at its height. Foreign immigration was active. "It is perfectly astonishing," says the editor, "how the country is growing in every direction, and as a natural sequence the trade in the various cities and business centers grows with the progress of the camps, colonies and provinces."

The new vault at the Sub-Treasury in New York is a veritable strong box on a large scale. Its walls are made of five layers of iron and steel, forming a total thickness of about 2 inches, locked together by a great number of double-headed screw-bolts made of chrome steel, such as almost defies the best burglars' tool made. Its cost was about \$16,000. The contents of the chamber now amount to about \$40,000,000 in gold bars.

Capt. Stephen Romer Roe, who died in this city last week, aged 77 years, for a long time commanded the fine Hudson River steamer New World, which enjoyed the reputation of being the finest and fastest boat ever built.

Superintendent McCall, of the Insurance Department, has resigned, to enter the service of the Equitable Life Assurance Society of the United States as comptroller.

The Marquis of Lorne has been appointed honorary commissioner for Canada at the Indian and Colonial Exhibition, and Lord Monck vice-president.

Zanzibar and Germany have signed a treaty of commerce, the provisions of which favor the Hamburg mercantile community and the East African Society.

The Boston tax levy for 1885 is \$8,693,747, the rate of taxation being \$12.80 on \$1000. Last year the rate of taxation was \$17 on \$1000. While there is a gain of \$7,884,900 in the valuation of real estate, there is a loss of \$5,096,900 on personal property from last year.

Mr. Langston, ex-Consul General to Hayti, says our commerce, both with that country and San Domingo, is growing. The inhabitants depend mainly on the United States for their flour and provisions, and the United States hold the foremost place in providing edge tools, hoes and ruder implements. As to cottons, complaint is made that our manufacturers do not sufficiently regard the wants of the people as to pattern and package.

The Brazilian Minister of Finance expresses himself strongly on the question of smuggling, alleging that it occasions heavy losses to the Treasury.

Georgia farming is now conducted on the principle of cultivating few acres, but cultivating them well. Wonderful results have already been accomplished, and throughout the South the necessity of improving upon the old system is recognized.

The Bayview Asylum, in Baltimore, has water storage for 230,000 gallons and a powerful Worthington steam pump.

A gas well has been struck at Miller, in the Ohio Valley, at a depth of 1000 feet, which is estimated to have a pressure of 400 pounds per square inch. The roar of the escaping gas can be heard for miles around.

The Dock Department is making a renewed effort to clear the space known as West Washington Market, which is much needed for the accommodation of shipping.

Brass entered more largely into the manufacture of holiday goods this year than ever before.

The shipments of roofing slate from Slatton, Pa., for this year are estimated at 118,000 squares, the same as in 1883. The price in that market has averaged \$3.50 per square.

According to the Philadelphia Record prominent builders in that city have received communications from agents of Belgian manufacturers stating that iron beams and girders can be furnished them, freight and duty prepaid, for 2½ cents per pound. For years past the price of these articles has been uniform in this country, being fixed by a combination of iron manufacturers. This year the price fixed upon was 3 cents per pound to all buyers, no discount being allowed, no matter how large the amount bought. Any firm deviating from this price was subject to a heavy fine. The firms in the combination are the Phoenix Iron Co., of Phoenixville; the Passaic Rolling Mill, of New Jersey; Carnegie Brothers, of Pittsburgh; Jones & Loughlin, of Pittsburgh; the Pencoyd Iron Works, and the New Jersey Steel and Iron Co., of Trenton, of which Abram S. Hewitt is the president.

On the line of the Georgetown, Breckinridge and Leadville Railroad is a remarkable piece of engineering work. After leaving Silver Plume the road forms what is known as a spiral. A spiral is a device for gaining distance on heavy grades, by which the line, in descending, is turned back on itself and crosses under itself at a lower elevation. In the short distance of ¾ mile this road

descends 179 feet. It passes along the side of a mountain, turns on a long "fill," and passes along the side of the same mountain further down. After crossing the stream to the slope on the opposite side of the valley, and then recrossing, the road again crosses on a bridge 80 feet above the stream, turns back on the opposite slope, turns again and passes under the last-mentioned bridge nearly on a level with the stream, thus making a circle a thousand or more feet in circumference.

The Knights of Labor in the Connecticut House of Representatives, and those elected by the influence of the Knights, number at least 70, and are endeavoring to obtain control in that body.

A Buffalo paper says the New York Central Sleeping Car Co. have placed with the Pullman Co. a contract for 55 first-class passenger coaches, 48 new sleepers and 15 new drawing-room cars.

A memorial to Congress has been signed by many members of commercial bodies in New York asking that the Secretary of War shall be authorized to contract for "the deepening and widening of a channel of the outer bay of New York, to afford a depth of 30 feet at low mean tide, in whichever channel experience has indicated as capable of being practically maintained in depth and width by the operation of nature alone, after the construction of permanent guiding works, and which shall be effectually lighted at night throughout its entire length, and that the amount required to defray the cost thereof be appropriated by Congress."

The House Ordnance Commission in Congress will report that all the steel needed for armor plates either for ships or for land fortifications, and all the steel ingots needed for the manufacture of guns for the navy or for coast defenses, can be manufactured in this country. They will also recommend that the necessary appropriation be made at once. Mr. Cameron, from the Senate Ordnance Commission, has already introduced bills authorizing contracts for 20,000 tons of steel—10,000 each for the army and navy—and appropriating \$2,000,000 additional to construct at the Washington Navy-Yard and the Watervliet Arsenal (\$1,000,000 for each) a plant sufficient to finish the heaviest ordnance in accordance with the recommendations of the Gun Foundry Board. The recommendations of the House Commission will not vary materially from the plan proposed by Mr. Cameron. The testimony taken by the House Commission shows that American manufacturers are ready to take contracts now for steel guns at 20 per cent. advance on Krupp's prices, and the number of firms who would be glad to take such contracts is large enough to make it almost certain that unless they combine among themselves to keep prices up and divide the profits the United States can purchase the materials for heavy ordnance or the completed guns cheaper and of a better quality from American manufacturers than in Europe.

There are now only six iron and steel mills in Pittsburgh and Allegheny where coal is used as a fuel. At the Pittsburgh Forge and Iron Works, at Verner Station, gas made from slack coal by the Siemens process is used in the heating furnaces. The puddling furnaces and all other parts of the mill are still operated by coal. Oliver Brother & Phillips still operate their Allegheny mills with coal, and in their South-side mills natural gas is only used in the puddling furnaces. The other mills using coal are the Elba Iron and Bolt Works, the Anchor Nail and Tack Works, the Kensington Mill and the La Belle Mill. The last-named mill changed from gas to coal on account of the failure of the supply. The total daily consumption of coal in the iron mills is now 33,800 bushels. The Continental Tube Works claim that they can turn out a better pipe with less iron than they did when using coal. There is less scaling and a more equal heat.

Mr. Laverty, the State Prison Keeper of New Jersey, in his annual report devotes considerable space to the discussion of the "piece-price" plan of convict labor, which went into operation in October. He pronounces this plan "an unqualified success." Prison discipline is improved, no large cost is likely to be entailed on the State, and competition with honest labor has been reduced to narrow limits.

On Sunday a terrific wind blew the wooden platform at the Pelhamville station of the New Haven Railroad directly upon the right-hand track, and the engineer did not see the obstruction until the train was within 100 feet of it. The locomotive and the postal car were pitched down an embankment 70 or 80 feet high, and, although the three following cars kept on the track, the three last, which were sleeping cars, literally hung over the edge. Only one life was lost, that of the fireman, but many were injured.

After fighting the New York Elevated Railroad for nearly eight years in various courts of the city, Rufus Story has at last secured a verdict awarding him \$1000 damages.

To build a tunnel under Broadway is the object of the New York District Railway Co., just organized by a number of responsible men. The route extends from the Bat-

tery to Harlem River, comprising about 13 miles of track, and the plan is to lay two "express" tracks and two "way" tracks, with continuous galleries on either side, arranged to house all the present water, gas, pneumatic, steam and other pipes which occupy the street below, together with all electric cables and wires, all service-pipes, &c., which will at all times be accessible. The tracks will be separated by five partitions, composed of columns 4 feet apart, the space between the columns being filled in by panels of "ferflax," a patented material made of a netting of iron filled in with non-resonant, fibrous material. The roof is to be supported and the whole structure tied by beams placed 4 feet apart, extending over the whole street and bolted to the upright columns. The cars to be used will be constructed of "ferflax," and will contain neither wood nor glass. Among the engineers and constructors are David H. King, Jr., George B. Post, Charles C. Martin and Alfred P. Boller.

The cost of conducting the government of the principal cities in the United States is shown in a document submitted to the New York Board of Apportionment by the Council of Reform. The items include the redemption of and interest on their funded debt:

Cities.	Population.	Yearly expenditures.	Per capita cost.
New York.....	1,338,050	\$48,942,178	\$36.65
Brooklyn, N. Y.....	650,000	8,065,017	10.88
Albany, N. Y.....	101,423	1,359,000	13.39
Rochester, N. Y.....	100,000	1,078,038	10.78
Buffalo, N. Y.....	202,818	2,038,322	10.14
Providence, R. I.....	117,850	2,305,000	18.71
Jersey City, N. J.....	180,840	1,523,430	11.41
Newark, N. J.....	155,000	1,742,012	11.24
Philadelphia, Pa.....	967,995	14,388,759	16.09
Baltimore, Md.....	400,000	4,106,447	10.26
Washington, D. C.....	326,450	3,537,136	17.28
New Orleans, La.....	228,425	1,747,496	5.02
Cincinnati, Ohio.....	270,000	3,022,383	14.52
Cleveland, Ohio.....	193,800	1,637,698	8.75
Chicago, Ill.....	680,000	10,195,404	16.18
Detroit, Mich.....	133,300	1,537,771	11.46
Milwaukee, Wis.....	137,500	1,438,970	9.07
St. Paul, Minn.....	120,000	1,123,185	9.35
St. Louis, Mo.....	400,000	5,596,113	13.99
London.....	4,776,061	35,300,000	7.40
Paris.....	2,286,329	15,440,000	5.40
Berlin.....	1,271,940	9,351,923	7.37

Average per capita cost, exclusive of New York City, \$11.95.

The distinguished Russian traveler, Colonel Prejevalsky, has returned from his explorations in the vast region lying between Siberia and China, covering a distance of about 20,000 miles, and his researches have made large additions to our knowledge of Mongolia, Tibet and Eastern or Chinese Turkestan. The explorer says that gold is plentiful in Northern Tibet. Not far from the sources of the Hoang-Ho he found natives washing gold. Though they dug only 1 or 2 feet below the surface, he says they showed him whole handfuls of gold in lumps as big as peas, and he believes that with careful working vast treasures would be found there. He predicts that in the course of time Northern Tibet will be found to be as rich as and perhaps richer than California in the precious metals that lie in the soil of this desert tableland.

In Chicago during the past year the aggregate of building permits issued represented a value of \$19,062,570, which is about the same as in 1884. Included were permits for 342 flats, 2413 dwellings and 38 factories. The real estate transfers aggregated 6936, representing \$36,746,592, an increase of more than \$3,250,000 over last year.

M. Francois Jules P. Grevy was re-elected President of the French Republic in the joint vote of the Senate and Chamber of Deputies acting as a National Assembly. The total majority was 135. The ruling desire was to elect a safe man.

Shipping merchants in New York are alarmed by the proposition of the Board of Apportionment to reduce the appropriation for the maintenance of the nautical school-ship St. Mary's to \$15,000, which, it is said, would be a fatal blow to the institution.

The elevated railroad in Hoboken, between the ferry and the Heights, is slowly approaching completion. At the base of the hill, where the piles are driven deepest, the elevated structure is 97 feet high, and is supported on towers, so called, which are made of four iron pillars braced with iron rods. The towers are 50 feet square at the bottom and 22 feet square at the top, each of the four pillars resting on brick foundations. The cable system will be used, the cable being worked by two 500-hundred horse-power Corliss steam engines situated at the upper end of the route. The rails are laid on channel bars that rest in the structural girders and at the same time afford in themselves guard-rails to prevent the car, in case of accident, from leaving the track.

First Water Works in the United States.—On the best authority available it is believed that the first water works in the United States were planned and constructed by John Christopher Christensen, at Bethlehem, Pa., in 1762. The machinery consisted of three single acting force pumps, 4 inch caliber and 18-inch stroke, worked by a triple crank, and geared to the shaft of an undershot water-wheel 18 feet in diameter and 2 feet clear in the buckets. The total head of water was 2 feet. On the water-wheel shaft was a wallower of 33 rounds, gearing into a spur-wheel of 52 cogs, at-

tached to the crank. The three piston rods were attached each to a frame or crosshead, working in grooves, to give them a parallel motion with the pump. The crosshead was of wood, as well as the parts containing the grooves or guides. The water was raised by this machinery to the height of 70 feet, and subsequently to 114 feet. These works were in operation as late as 1832. The first rising main was made of gumwood as far as it was subject to pressure, and the rest was of pitch pine. In 1786 leaden pipes were substituted, and in 1813 they were changed for iron.

SCIENTIFIC AND TECHNICAL.

The Estimation of Carbonic Acid and Hydrocarbons in Gas.

A simple method for determining the amounts of carbonic acid, sulphureted hydrogen and illuminating hydrocarbons in gas has been devised by M. Chevalet. Although it cannot claim a greater degree of accuracy than many other forms of apparatus for a similar purpose now in use, it may be found more convenient in certain cases. A description of the apparatus is given in the *Journal des Usines à Gaz*. It consists of an upright cylinder provided with a stop-cock at the lower end, and at the upper end a bent tube, the end of which is immersed in a colored liquid. The absorption of carbonic acid and sulphureted hydrogen is effected by introducing into the cylinder a stick of caustic potash of known volume. The air is then driven out by connecting the lower opening with the gas supply and the stop-cock closed. As the carbonic acid and sulphureted hydrogen are absorbed by the potash, the liquid rises in the bent tube, which should be graduated, and the divisions of which should bear some known relation to the entire volume of gas in the cylinder. After about 15 or 20 minutes the liquid in the tube remains stationary, and the absorption is complete. The larger divisions on the tube can be made to represent 1/10 of the volume of the cylinder and connecting tubes, in which case the percentage of absorbed gases would be indicated by the number of divisions the liquid had risen in the tube. By subdividing the larger divisions fractions of 1 per cent. can be read. It is hardly necessary to say that the temperature should remain constant during the test, and that the cylinder should not be handled. If for any reason this has been done, the reading of the liquid in the tube should not be made until the temperature has become the same as at the beginning of the test. In making the reading the vessel of the colored liquid should be raised until the liquid is at the same level as that in the tube. For determining the amount of illuminants absorbed by bromine the openings must have glass stop-cocks, the upper one terminating in a tube having a capacity of at least 5 c. cm. In making the test the cylinder is filled with gas and the stop-cocks closed. In the tube above the upper stop-cock is placed 1/2 c. cm. of bromine, diluted with water to 5 c. cm. This is allowed to pass into the cylinder, care being taken that no air enters. The cylinder is shaken to bring the gas in contact with the bromine, and then 5 c. cm. of strong solution of caustic potash is introduced to remove the bromine. A bent tube, graduated as for the absorption of carbonic acid, is then fitted to the upper tube, its lower end being immersed in a colored liquid. On opening the upper stop-cock the liquid rises in the tube, and the number of division, plus the volume of liquids introduced, gives the amount of gases absorbed. From this must be taken the amount of carbonic acid found in the first test to give the amount of hydrocarbons.

Mechanical Glass-Blowing.

Messrs. Appert have devised a process in their factory at Clichy in which they use air stored under great pressure, so as to dispense altogether with the necessity of blowing by the mouth. Glass blowers are peculiarly susceptible to various disorders, such as diseases of the lips and cheeks, and predisposition to tumors and rupture. These affections are the more serious because boys are often employed, when the system is weakened by rapid growth. The high temperature and dry atmosphere increases the unfavorable hygienic conditions. The new process entirely suppresses blowing by boys, and, with rare exceptions, by adults also. The manufacture of glassware is thus ameliorated by rapidity of execution, as well as by the perfection and the large size of the pieces which are produced.

Malleable Nickel.

The manufacture of malleable nickel, as the result of M. Garnier's experiments, has been realized by the addition of 0.3 per cent. of phosphorus or manganese, and others have found that by adding 1/2 to 1/4 per cent. of magnesium it is practicable to weld the nickel thus obtained to iron and steel, roll it out in sheets and shape it into tubes, pipes, &c. A series of tests made with the solid malleable nickel gave the following results: In the case of a 0.465-inch round bar there was exhibited a limit of elasticity of not far from 60,000 pounds, a tensile strength of about 96,000 pounds, with an elongation of 10.6 per cent. and a contraction of area of 57.6 per cent. A second, 0.44 inch in diameter, had an elastic limit of nearly 41,000 pounds, a tensile strength of about 79,000 pounds, an elongation of 20.25 per cent. and a contraction of area of 45.5 per cent.

An interesting series of figures has been compiled by Duncan & Co., of Calcutta, to show how the traffic between Calcutta and Europe has been affected by the completion of the Suez Canal:

	Via Suez Canal.	Around the Cape.
1870.....	44,000 Tons.	340,000 Tons.
1871.....	111,000	465,000
1872.....	133,000	374,000
1873.....	139,000	352,000
1874.....	154,000	275,000
1875.....	152,000	343,000
1876.....	208,000	501,000
1877.....	348,000	587,000
1878.....	228,000	327,000
1879.....	244,000	359,000
1880.....	280,000	467,000
1881.....	396,000	336,000
1882.....	487,000	440,000

The route around the Cape has held its own much better than is generally believed.

C. Hammond & Son.....	dis 40&10		
Shingling, Nov. 1 2 3.....	per doz	\$8.00	\$8.50 \$9.00

C. Hammond & Son.
Shingling, Nov. 12

[illegible]

Hard Metal.....dis 50&10 1/2
ush's.....dis 20 1/2
ncolin's Fastener.....dis 70&10 1/2
eed's.....dis 20&10 1/2
oes Nos. 1 2 3 4
 \$7.00 8.00 9.00 10.00, **ψ** doz, dis 60&10&10 1/2
Money Drawers.....**ψ** doz, \$18.
Carpet Nails.....See Trade
ails.....See Trade Report
Wire Nails, list Nov. 11, 1888.....dis 50&10 1/2
Nail Puller.....
urtise Hammer.....**ψ** doz \$9.00 net
ant. No. 1.....**ψ** doz \$20.00, dis 10 net
ilican.....**ψ** doz \$30.00, dis 25 net
Nuts and Washers.....
ure Nuts.....94¢ off list
uaron.....104¢ off list
ashers.....94¢ & 104¢ off list
 lots less than 100 **ψ**, **ψ** add 1/2¢ to list 1 lb
 boxes, 1/2 to list.
Nut Crackers.....
ible (Humason & Beckley Mfg. Co.).....dis 40 net
ake's Pattern.....**ψ** doz \$2.00, dis 10 net
rner & Seymour Mfg. Co......dis 50 net
akum.....
Government.....**ψ** 74¢ & 75¢
S. NAVY.....**ψ** 63¢ & 67¢
vy.....**ψ** 54¢ & 67¢
Dilers.....
ic and Tin.....dis 65¢ & 65¢ & 10 net
use and Copper.....dis 60¢ & 10 net
leable (Hammer) No. 1, \$4.00.....dis 40 net
o. S. \$1.60 **ψ doz**.....dis 10 & 10 1/2 net
ors' Patent or "Paragon" Zinc.....dis 60&10 1/2 net
ors' Patent or "Paragon" Brass.....dis 50 net
rs' Patent or "Paragon" Brass.....dis 50 net
instead of Tin and Zinc.....dis 50 net
instead of Brass and Copper.....dis 50 net
ughton's Zinc.....dis 50 net
ughton's Brass.....dis 50 net

Steel, Single **ψ Bath Yarn**.....**ψ** 8 net
Cotton Rope.....**ψ** 15 @ 18¢ net
Jute Rope.....**ψ** 15 @ 18¢ net
Rules.....
Boxwood.....dis 80&10 @ 80&10 1/2 net
Ivory.....dis 55 @ 55&10 1/2 net
Stephens' Ivory.....dis 50 net
Iron.....
From 4 to 10, at factory.....**ψ** 100 **ψ** \$2.25 @ \$2.50
Self Heating.....**ψ** doz, \$9.00 net
Heating, Tailors.....**ψ** doz, \$18.00 net
gleson's Shield and Toilet.....dis 35 net
Mrs. Pott's Iron, Double Pointed.....dis 35 @ 40 net
Mrs. Pott's Iron, Square Back.....dis 35 @ 40 net
Enterprise Star Irons, new list, July 30, 1882.....dis 35 net
Combined Fluter and Sud Iron.....**ψ** doz, \$15.00, dis 15 net
Fox Reversible, Self Fluter.....**ψ** doz, \$24.90 net
Chinese Laundry (B. & Butt Co.).....dis 15 net
New England.....dis 15 net
Sand Paper and Emery Paper.....
Baeder & Adamson's Flint, 2 1/2 & 3 **ψ ream**.....dis 40 net
Baeder & Adamson's Flint, 2 1/2 & 3 **ψ ream**.....dis 40 net
Baeder & Adamson's Flint, assorted.....dis 40 net
Baeder & Adamson's Star.....dis 40 net
Bloodgood's Flint, Nos. 40 to 136, **ψ ream \$1.50**.....dis 40 net
Bloodgood's Flint, assorted.....**ψ** ream 4.50
Bloodgood's Flint, Nos. 4 to 3.....**ψ** ream 5.00
Bloodgood's Flint, No. 354.....**ψ** ream 5.00
Columbia Flint, all Nos.....**ψ** ream 4.00
Madison Mills Flint, all Nos.....**ψ** ream 3.50
Emery Paper, 60 to 136, \$5.50; 2, \$7.50; 2 1/2, \$9.50.....dis 40 @ 45 net
Emery Cloth, B. & Co., 10 to 136, \$18; 2, \$20.....dis 40 @ 45 net
2 1/2, \$24.....dis 40 @ 45 net
Emery or Crocus Cloth, Stibley, 9x12 in., \$10.00.....dis 40 @ 45 net
Emery or Crocus Cloth, Stibley, 12x18 in., \$10.50.....dis 40 @ 45 net
New England, same list as B. & A. Flint.....dis 40 @ 45 net
Sand Paper without brand.....**ψ** ream, \$1.75 @ \$2 net
Rush Card.....
Common.....**ψ** 124¢ @ 134¢ net
Patent.....**ψ** 124¢ @ 164¢ net
White Cotton Braid, fair quality.....**ψ** 30¢ @ 32¢ net
Common Russia Sash.....**ψ** 14¢ net
Patent.....**ψ** 18¢ net
Cable Laid Italian.....**ψ** 30¢ net
India Cable Laid.....**ψ** 16¢ net

Nickel-Plating and Polishing Materials.

SOLE MANUFACTURERS OF

Established 1863. Incorporated 1881.

THE

AMERICAN DYNAMO ELECTRO-PLATING MACHINE.

Largest Manufacturers IN THE WORLD OF

Nickel Anodes,
 Nickel Salts,
 Patent Muslin Buffs,
 Polishing Lathes,
 Polishing Felt,
 Polishing Rouges,
 Pol'ng Compositions,
 Walrus Leather,
 Wood Emery Wheels,
 Platers' Brushes,
 &c., &c., &c.

Best Plating Machine
In the Market.
HEADQUARTERS FOR
EVERYTHING
IN THE PLATING AND
POLISHING LINE.

Zucker & Levett Chemical Co.,
 538 to 564 W. 16th St.,
 36 to 40 11th Ave., NEW YORK, U. S. A.

WORKS: 538 to 564 W. 16th St.,
 OFFICES: 36 to 40 11th Ave., NEW YORK, U. S. A.

WHOLESALE METAL PRICES, December 30, 1885.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb; provided that no Bar Iron shall pay a less rate of duty than 85¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Scroll, 12¢ to 14-10¢ per lb. Railroad Bars weighing more than 25 lb per yard, 7-10¢ to 14-10¢ per lb.

Standard American Pig Iron.

Foundry No. 1, 11-0¢ to 11-10¢ per lb.
Foundry No. 2, 10-50¢ to 10-70¢ per lb.
Gray Forge, 10-50¢ to 10-70¢ per lb.

No. 1 Scotch Pig Iron.

Carnegie, 10-50¢ to 10-70¢ per lb.
Coltess, 10-50¢ to 10-70¢ per lb.
Shotts, 10-50¢ to 10-70¢ per lb.
Glenbrook, 10-50¢ to 10-70¢ per lb.
Langdon, 10-50¢ to 10-70¢ per lb.
Summerlee, 10-50¢ to 10-70¢ per lb.
Lalmlington, 10-50¢ to 10-70¢ per lb.
Eglington, 10-50¢ to 10-70¢ per lb.
Clyde, 10-50¢ to 10-70¢ per lb.

Rails.

Steel, at Eastern mills, 11-0¢ to 11-10¢ per lb.
Old Rails, 10-50¢ to 10-70¢ per lb.

Scrap.

Wrought, 10-50¢ to 10-70¢ per lb.
Cast Iron from Store, 10-50¢ to 10-70¢ per lb.

Common Iron, 10-50¢ to 10-70¢ per lb.
1 to 6 in. round and square, 10-50¢ to 10-70¢ per lb.
Refined Iron, 10-50¢ to 10-70¢ per lb.
1 to 6 in. round and square, 10-50¢ to 10-70¢ per lb.
1 to 6 in. round and square, 10-50¢ to 10-70¢ per lb.
Rods, 10-50¢ to 10-70¢ per lb.
Bands, 10-50¢ to 10-70¢ per lb.
Burden's Best Iron, base price, 10-50¢ to 10-70¢ per lb.
Burden's "H. B. & S." Iron, base price, 10-50¢ to 10-70¢ per lb.
Norway Nail Rods, 10-50¢ to 10-70¢ per lb.

Sheet Iron from Store.

Common, 10-50¢ to 10-70¢ per lb.
American, 10-50¢ to 10-70¢ per lb.
R. G., 10-50¢ to 10-70¢ per lb.

Nos. 10 to 16, 10-50¢ to 10-70¢ per lb.
17 to 24, 10-50¢ to 10-70¢ per lb.
25 to 30, 10-50¢ to 10-70¢ per lb.
31 to 36, 10-50¢ to 10-70¢ per lb.
37 to 42, 10-50¢ to 10-70¢ per lb.
43 to 48, 10-50¢ to 10-70¢ per lb.
49 to 54, 10-50¢ to 10-70¢ per lb.
55 to 60, 10-50¢ to 10-70¢ per lb.

Galvanized, 10 to 20, 10-50¢ to 10-70¢ per lb.
Galvanized, 21 to 24, 10-50¢ to 10-70¢ per lb.
Galvanized, 25 to 30, 10-50¢ to 10-70¢ per lb.
Galvanized, 31 to 36, 10-50¢ to 10-70¢ per lb.
Galvanized, 37 to 42, 10-50¢ to 10-70¢ per lb.
Galvanized, 43 to 48, 10-50¢ to 10-70¢ per lb.
Galvanized, 49 to 54, 10-50¢ to 10-70¢ per lb.
Galvanized, 55 to 60, 10-50¢ to 10-70¢ per lb.

American Russia, 10-50¢ to 10-70¢ per lb.
Russia, 10-50¢ to 10-70¢ per lb.
American Cold Rolled B. B., 10-50¢ to 10-70¢ per lb.

Iron Wire.—(See Wire.)

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb or less, 45¢ ad val; valued above 4¢ and not above 10¢ per lb, 25¢ ad val; valued above 10¢ per lb, 35¢ ad val. Extra—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 15¢ per lb in addition to above; Steel Circular Saw Plates, 1¢ per lb in addition to the above.

American Cast Steel.
For American Steel, see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes, 10 to 14¢ per lb.
Adamantine Shoes and Dies, 10 to 14¢ per lb.
Magnet Steel, 14 to 16¢ per lb.

English Steel.

Best Cast, 10 to 14¢ per lb.
Extra Cast, 10 to 14¢ per lb.
Circular Saw Plates, 10 to 14¢ per lb.
Round Machinery, Cast, 10 to 14¢ per lb.
Swaged, Cast, 10 to 14¢ per lb.
Best Double Shear, 10 to 14¢ per lb.
Blister, 1st quality, 10 to 14¢ per lb.
German Steel, Best, 10 to 14¢ per lb.
2d quality, 10 to 14¢ per lb.
3d quality, 10 to 14¢ per lb.
Sheet Cast Steel, 1st quality, 10 to 14¢ per lb.
2d quality, 10 to 14¢ per lb.
3d quality, 10 to 14¢ per lb.

TIN.—Duty: Plates, Sheets, Tagger and Terme, 1¢ per lb; Bars, Block and Pigs free.

Banco, 11-0¢ to 11-10¢ per lb.
Straite, 11-0¢ to 11-10¢ per lb.
English, 11-0¢ to 11-10¢ per lb.
Bar, 11-0¢ to 11-10¢ per lb.

Charcoal Tin Plates.

1 C 10x14 225 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x12 225 sheets, 10-50¢ to 10-70¢ per lb.
1 C 10x20 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 X 10x14 225 sheets, 10-50¢ to 10-70¢ per lb.
1 X 12x12 225 sheets, 10-50¢ to 10-70¢ per lb.
1 X 10x20 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x14 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x18 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x20 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x22 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.

Coke Tin Plates.

1 C 10x14 225 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x12 225 sheets, 10-50¢ to 10-70¢ per lb.
1 C 10x20 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 X 10x14 225 sheets, 10-50¢ to 10-70¢ per lb.
1 X 12x12 225 sheets, 10-50¢ to 10-70¢ per lb.
1 X 10x20 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x14 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x18 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x20 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.
1 C 12x22 112 1/2 sheets, 10-50¢ to 10-70¢ per lb.

Terne Plates.

1 C 14x20 M. F., 10-50¢ to 10-70¢ per lb.
1 C 14x20 Old Process, 10-50¢ to 10-70¢ per lb.
1 C 14x20, 10-50¢ to 10-70¢ per lb.
1 X 14x20, 10-50¢ to 10-70¢ per lb.
1 C 14x20, 10-50¢ to 10-70¢ per lb.
1 X 14x20, 10-50¢ to 10-70¢ per lb.
1 C 14x20, 10-50¢ to 10-70¢ per lb.
1 X 14x20, 10-50¢ to 10-70¢ per lb.

Tin Boiler Plates.

1XX 14x20, 2 sheets for No. 7, 112 sheets, 10-50¢ to 10-70¢ per lb.
1XX 14x20, 2 sheets for No. 8, 10-50¢ to 10-70¢ per lb.
1XX 14x20, 2 sheets for No. 9, 10-50¢ to 10-70¢ per lb.
1XX 14x20, 2 sheets for No. 10, 10-50¢ to 10-70¢ per lb.
1XX 14x20, 2 sheets for No. 11, 10-50¢ to 10-70¢ per lb.
1XX 14x20, 2 sheets for No. 12, 10-50¢ to 10-70¢ per lb.

COPPER.—Duty: 1½¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Ingots, Lake, 11-0¢ to 11-10¢ per lb.
Ingots, Baltimore, 11-0¢ to 11-10¢ per lb.
Ingots, Anchor, 11-0¢ to 11-10¢ per lb.
Braziers' Copper, ordinary sizes, 10-50¢ to 10-70¢ per lb.
Braziers' Copper, 10 oz. and over, 10-50¢ to 10-70¢ per lb.
Braziers' Copper, 10 oz. and over 12 oz. sq. ft., 10-50¢ to 10-70¢ per lb.
Braziers' Copper, 10 oz. and over 12 oz. sq. ft., 10-50¢ to 10-70¢ per lb.
Braziers' Copper, 10 oz. and over 12 oz. sq. ft., 10-50¢ to 10-70¢ per lb.
Braziers' Copper, 10 oz. and over 12 oz. sq. ft., 10-50¢ to 10-70¢ per lb.

Lighter than 10 oz. sq. ft., 10-50¢ to 10-70¢ per lb.
Circles less than 24 in. diam., 10-50¢ to 10-70¢ per lb.
Circles less than 24 in. diam., 10-50¢ to 10-70¢ per lb.
Circles less than 24 in. diam., 10-50¢ to 10-70¢ per lb.
Circles less than 24 in. diam., 10-50¢ to 10-70¢ per lb.
Circles less than 24 in. diam., 10-50¢ to 10-70¢ per lb.

Segment and Pattern Sheets, 10-50¢ to 10-70¢ per lb.
Locomotive Fire-Box Sheets, 10-50¢ to 10-70¢ per lb.
Sheeting Copper, over 12 oz. sq. ft., 10-50¢ to 10-70¢ per lb.
Bolt Copper, 10-50¢ to 10-70¢ per lb.
Copper Bottoms, 10-50¢ to 10-70¢ per lb.
Nickel-Plated Sheet, 10-50¢ to 10-70¢ per lb.
Plating extra, 10-50¢ to 10-70¢ per lb.
Flat Copper Boiler Bottoms or Pits, 10-50¢ to 10-70¢ per lb.
Bottoms, cut to special sizes, 10-50¢ to 10-70¢ per lb.

Tinning.

14x18, by the case, 10-50¢ to 10-70¢ per lb.
14x18, less than case, 10-50¢ to 10-70¢ per lb.
For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper, Net, 10-50¢ to 10-70¢ per lb.
14 and 16 oz. and heavier, 10-50¢ to 10-70¢ per lb.
12 oz. and lighter, 10-50¢ to 10-70¢ per lb.

Boiler Sizes.

7 in. 14x20, 8 in. 14x20, 9 in. 14x20.
14 and 16 oz. and heavier, 10-50¢ to 10-70¢ per lb.
(All sizes not over 30 in. wide.)
24x48 and 30x60.
4 and 16 oz. and heavier, 10-50¢ to 10-70¢ per lb.
12 oz. and lighter, 10-50¢ to 10-70¢ per lb.

Copper Wire.—(See Wire.)

Sheathing Metal.
Yellow Sheathing Metal, 10-50¢ to 10-70¢ per lb.
Brown & Sharpe's Gauge the Standard for Metal.
Old English Gauge the Standard for Wire.
Brass Manufacturers' Price List, January 17, 1884.
E. R. A. D. Duty: Pig, 5¢ per lb; Old Lead, 3¢ per lb.
P. Pipe and Sheet, 3¢ per lb.
American, 10-50¢ to 10-70¢ per lb.
Black Ivory Drop, 10-50¢ to 10-70¢ per lb.

Black Lamp—Coach Painters' 10-50¢ to 10-70¢ per lb.
Black Ivory Drop, 10-50¢ to 10-70¢ per lb.
Best, 10-50¢ to 10-70¢ per lb.

Block Tin Pipe, 10-50¢ to 10-70¢ per lb.
Tin Lined Pipe, 10-50¢ to 10-70¢ per lb.
Sheet, 10-50¢ to 10-70¢ per lb.
Shot, 10-50¢ to 10-70¢ per lb.
Chilled Shot, 10-50¢ to 10-70¢ per lb.
ANTIMONY.
Hallett's, 10-50¢ to 10-70¢ per lb.
Cookson, 10-50¢ to 10-70¢ per lb.
SPELTER—Duty: Pigs, Bars and Plates, 10-50¢ to 10-70¢ per lb.
American, cash, 10-50¢ to 10-70¢ per lb.
Bergenport, 10-50¢ to 10-70¢ per lb.
ZINC—Duty: Pig or Block, 10-50¢ to 10-70¢ per lb.
60 lb cases, 10-50¢ to 10-70¢ per lb.
Zinc—Open, 10-50¢ to 10-70¢ per lb.
Zinc Tubing, 10-50¢ to 10-70¢ per lb.

Plain, 10-50¢ to 10-70¢ per lb.
Fancy, 10-50¢ to 10-70¢ per lb.
Scotch and Extra Patterns, 10-50¢ to 10-70¢ per lb.

BRASS.
N. P. U., 10-50¢ to 10-70¢ per lb.
X X, 10-50¢ to 10-70¢ per lb.
J. B., 10-50¢ to 10-70¢ per lb.

WIRE.
Market Wire.—Put up in 63 lb bundles.
Nos. 00 to 9, 10, 11, 13, 14, 15, 16, 17, 18.
10 11 11½ 12½ 14 15 16
Bright Market Wire, 10-50¢ to 10-70¢ per lb.
Charcoal, 10-50¢ to 10-70¢ per lb.
Bale Wire, Nos. 7 to 12, 10-50¢ to 10-70¢ per lb.
Annealed Market Wire, 10-50¢ to 10-70¢ per lb.
Fence Wire, Nos. 8 and 9, 10-50¢ to 10-70¢ per lb.
Grape Wire, Nos. 10 to 14, 10-50¢ to 10-70¢ per lb.
Coppered Market Wire, 10-50¢ to 10-70¢ per lb.
Bale Wire, Nos. 7 to 12, 10-50¢ to 10-70¢ per lb.
Galvanized Market Wire, 10-50¢ to 10-70¢ per lb.
Fence Wire, 10-50¢ to 10-70¢ per lb.

Stone or Weaving Wire.
Nos. 16 17 18 19 20 21 22 23 24 25 26
Cents, 14 15 16 17 18 19 20 21 22 23 24 25 26
Nos. 27 28 29 30 31 32 33 34 35 36
Cents, 28 29 30 31 32 33 34 35 36 37 38 39 40
Nos. 41 42 43 44 45 46 47 48 49 50
Cents, 41 42 43 44 45 46 47 48 49 50
Nos. 51 52 53 54 55 56 57 58 59 60
Cents, 51 52 53 54 55 56 57 58 59 60
Galvanized Stone Wire, 10-50¢ to 10-70¢ per lb.

Steel Wire.
Cast Steel, Steel Wire list, 10-50¢ to 10-70¢ per lb.
Old English Gauge the Standard.—Dis 20 to 25.
Common High Brass Copper.
All Nos. to No. 16, 10-50¢ to 10-70¢ per lb.
No. 17 and 18, 10-50¢ to 10-70¢ per lb.
No. 19 and 20, 10-50¢ to 10-70¢ per lb.
No. 21 and 22, 10-50¢ to 10-70¢ per lb.
No. 23 and 24, 10-50¢ to 10-70¢ per lb.
No. 25 and 26, 10-50¢ to 10-70¢ per lb.
No. 27 and 28, 10-50¢ to 10-70¢ per lb.
No. 29 and 30, 10-50¢ to 10-70¢ per lb.
No. 31 and 32, 10-50¢ to 10-70¢ per lb.
No. 33 and 34, 10-50¢ to 10-70¢ per lb.
No. 35 and 36, 10-50¢ to 10-70¢ per lb.
No. 37 and 38, 10-50¢ to 10-70¢ per lb.
No. 39 and 40, 10-50¢ to 10-70¢ per lb.
No. 41 and 42, 10-50¢ to 10-70¢ per lb.
No. 43 and 44, 10-50¢ to 10-70¢ per lb.
No. 45 and 46, 10-50¢ to 10-70¢ per lb.
No. 47 and 48, 10-50¢ to 10-70¢ per lb.
No. 49 and 50, 10-50¢ to 10-70¢ per lb.
No. 51 and 52, 10-50¢ to 10-70¢ per lb.
No. 53 and 54, 10-50¢ to 10-70¢ per lb.
No. 55 and 56, 10-50¢ to 10-70¢ per lb.
No. 57 and 58, 10-50¢ to 10-70¢ per lb.
No. 59 and 60, 10-50¢ to 10-70¢ per lb.

MISCELLANEOUS TINNERS' STOCK.
1½ and 1½ Warranted, 10-50¢ to 10-70¢ per lb.
Extra, 10-50¢ to 10-70¢ per lb.
No. 1 Refined, 10-50¢ to 10-70¢ per lb.
No. 2 Solder, 10-50¢ to 10-70¢ per lb.
Extra wiping, 10-50¢ to 10-70¢ per lb.

Rivets.
Iron and Tinned, new list, Dec. 10, 1881, 10-50¢ to 10-70¢ per lb.
In bulk, new list, Dec. 10, 1881, 10-50¢ to 10-70¢ per lb.
Copper Rivets and Burrs, 10-50¢ to 10-70¢ per lb.
Nos. 7 8 9 10 11 12 13 14 15
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100

Store Bolts.
American Screw Co.'s, 10-50¢ to 10-70¢ per lb.
R. B. & W., 10-50¢ to 10-70¢ per lb.
R. & E. Mfg. Co., 10-50¢ to 10-70¢ per lb.

FRENCH GLASS.
August 30, 1885. Per Box, 50 feet.
Single Thick.
SIZES. EFH IEH HH HB
25 6 x 8 to 10 x 15, 10-50¢ to 10-70¢ per lb.
40 11 x 14 to 16 x 24, 10-50¢ to 10-70¢ per lb.
50 18 x 22 to 30 x 30, 10-50¢ to 10-70¢ per lb.
54 15 x 36 to 24 x 36, 10-50¢ to 10-70¢ per lb.
60 20 x 28 to 24 x 36, 10-50¢ to 10-70¢ per lb.
70 26 x 36 to 36 x 44, 10-50¢ to 10-70¢ per lb.
80 26 x 46 to 30 x 50, 10-50¢ to 10-70¢ per lb.
84 30 x 52 to 30 x 54, 10-50¢ to 10-70¢ per lb.
90 30 x 56 to 34 x 56, 10-50¢ to 10-70¢ per lb.
94 34 x 58 to 34 x 60, 10-50¢ to 10-70¢ per lb.
100 36 x 60 to 40 x 60, 10-50¢ to 10-70¢ per lb.

Double Thick.
SIZES. EFH IEH HH HB
25 6 x 8 to 10 x 15, 10-50¢ to 10-70¢ per lb.
40 11 x 14 to 16 x 24, 10-50¢ to 10-70¢ per lb.
50 18 x 22 to 30 x 30, 10-50¢ to 10-70¢ per lb.
54 15 x 36 to 24 x 36, 10-50¢ to 10-70¢ per lb.
60 20 x 28 to 24 x 36, 10-50¢ to 10-70¢ per lb.
70 26 x 36 to 36 x 44, 10-50¢ to 10-70¢ per lb.
80 26 x 46 to 30 x 50, 10-50¢ to 10-70¢ per lb.
84 30 x 52 to 30 x 54, 10-50¢ to 10-70¢ per lb.
90 30 x 56 to 34 x 56, 10-50¢ to 10-70¢ per lb.
94 34 x 58 to 34 x 60, 10-50¢ to 10-70¢ per lb.
100 36 x 60 to 40 x 60, 10-50¢ to 10-70¢ per lb.

PAPER STOCK, &c.
(Dealers' Selling Prices.)
White Shirt Cuttings, No. 1, 10-50¢ to 10-70¢ per lb.
Mill Assorted Whites, No. 2, 10-50¢ to 10-70¢ per lb.
Unbleached Muslins, 10-50¢ to 10-70¢ per lb.
City Whites, No. 1, 10-50¢ to 10-70¢ per lb.
City Whites, No. 2, 10-50¢ to 10-70¢ per lb.
New Canton Flannels, 10-50¢ to 10-70¢ per lb.
New Seconds, light, 10-50¢ to 10-70¢ per lb.
Cotton Canvas, 10-50¢ to 10-70¢ per lb.
Linen Canvas, No. 1, 10-50¢ to 10-70¢ per lb.
Seconds, City No. 1, 10-50¢ to 10-70¢ per lb.
Seconds, City No. 2, 10-50¢ to 10-70¢ per lb.
Colors, 10-50¢ to 10-70¢ per lb.
Manila Rope, 10-50¢ to 10-70¢ per lb.
Gunny Bagging, No. 1, 10-50¢ to 10-70¢ per lb.
Kentucky Bagging, 10-50¢ to 10-70¢ per lb.
Burlap Bagging, No. 1, 10-50¢ to 10-70¢ per lb.
Tar Shavings, 10-50¢ to 10-70¢ per lb.
Hemp Twine Stock, 10-50¢ to 10-70¢ per lb.
Hard White Shavings, No. 1, 10-50¢ to 10-70¢ per lb.
Soft White Shavings, No. 1, 10-50¢ to 10-70¢ per lb.
White Shavings, No. 2, soft, 10-50¢ to 10-70¢ per lb.
Mixed Shavings, part White, 10-50¢ to 10-70¢ per lb.
Lumber and Writings, 10-50¢ to 10-70¢ per lb.
Solid Stock, 10-50¢ to 10-70¢ per lb.
Book Stock, No. 1, light, 10-50¢ to 10-70¢ per lb.
Old Newspapers, 10-50¢ to 10-70¢ per lb.
Pure Manilla, 10-50¢ to 10-70¢ per lb.
Bagus Manilla and Hardwares, 10-50¢ to 10-70¢ per lb.
Commons, 10-50¢ to 10-70¢ per lb.
Binders Board Cuttings, 10-50¢ to 10-70¢ per lb.
Straw Board Cuttings, 10-50¢ to 10-70¢ per lb.

PAINTS, OILS, &c.
Paints.
Black Lamp—Coach Painters' 10-50¢ to 10-70¢ per lb.
Black Ivory Drop, 10-50¢ to 10-70¢ per lb.
Best, 10-50¢ to 10-70¢ per lb.

Black Paint, in oil, 10-50¢ to 10-70¢ per lb.
Blue, Prussian, fair to best, 10-50¢ to 10-70¢ per lb.
Chinese dry, 10-50¢ to 10-70¢ per lb.
Ultramarine, 10-50¢ to 10-70¢ per lb.
Brown, Spanish, 10-50¢ to 10-70¢ per lb.
Van Dyke, 10-50¢ to 10-70¢ per lb.
Dryers, Patent American, 10-50¢ to 10-70¢ per lb.
Green Chrome, 10-50¢ to 10-70¢ per lb.
Red Lead American, 10-50¢ to 10-70¢ per lb.
Paris, 10-50¢ to 10-70¢ per lb.
Iron Paint, Bright Red, 10-50¢ to 10-70¢ per lb.
Brown, 10-50¢ to 10-70¢ per lb.
Purple, 10-50¢ to 10-70¢ per lb.
Ground in oil, 10-50¢ to 10-70¢ per lb.
Red, 10-50¢ to 10-70¢ per lb.
Brown, 10-50¢ to 10-70¢ per lb.
Purple, 10-50¢ to 10-70¢ per lb.

Litharge, 10-50¢ to 10-70¢ per lb.
Mineral Paints, 10-50¢ to 10-70¢ per lb.
Orange Mineral, 10-50¢ to 10-70¢ per lb.
Venetian (Eng.) dry, 10-50¢ to 10-70¢ per lb.
Indian Dry, 10-50¢ to 10-70¢ per lb.
Rose Pink, 10-50¢ to 10-70¢ per lb.
Sienna, American Raw, powdered, 10-50¢ to 10-70¢ per lb.
Burnt, powdered, 10-50¢ to 10-70¢ per lb.
Raw, 10-50¢ to 10-70¢ per lb.
Umber, Burnt, powdered, 10-50¢ to 10-70¢ per lb.
Raw, powdered, 10-50¢ to 10-70¢ per lb.
Vermilion, Chinese, 10-50¢ to 10-70¢ per lb.
English, Common, 10-50¢ to 10-70¢ per lb.
White Lead, American, pure dry, 10-50¢ to 10-70¢ per lb.
White Lead, English Prime, 10-50¢ to 10-70¢ per lb.
Yellow Ochre, French, 10-50¢ to 10-70¢ per lb.
Yellow Chrome, 10-50¢ to 10-70¢ per lb.
Zinc White, American No. 1, dry, 10-50¢ to 10-70¢ per lb.
No. 1, in oil, 10-50¢ to 10-70¢ per lb.
French (Paris) Dry, 10-50¢ to 10-70¢ per lb.

Oils.
Bleached Whale, 10-50¢ to 10-70¢ per lb.
Sperm, 10-50¢ to 10-70¢ per lb.
Elephant, 10-50¢ to 10-70¢ per lb.
Drilling, 10-50¢ to 10-70¢ per lb.
R. & R. Best Valvone Cylinder, 10-50¢ to 10-70¢ per lb.
Engine, 10-50¢ to 10-70¢ per lb.
Fish Oil, Pressed, 10-50¢ to 10-70¢ per lb.
Lard, Prime Winter, 10-50¢ to 10-70¢ per lb.
No. 1 Extra, 10-50¢ to 10-70¢ per lb.
Lined, Raw in casks and bbls, 10-50¢ to 10-70¢ per lb.
Belled

INDUSTRIAL ITEMS.

NEW HAMPSHIRE.

The Boston and Lowell railway corporation have given the Manchester works an order for five new locomotives.

MASSACHUSETTS.

An L 24 x 70, two stories in height, is being added to the factory of the Putnam Tool Co., Fitchburg, which will be ready for occupancy next month. They are putting in a 50-horse-power Putnam engine and two 50-horse-power boilers made by Wm. Allen & Son, Worcester.

The Kilburn & Lincoln Machine Co., of Fall River, have recently completed and delivered 100 of their improved 40-inch looms for the Davol Mills, and are now at work on 216 of these looms for the Borden City Mfg. Co. They are also furnishing the shafting for the Duffee Mills.

The molders of the Mason Machine Works, at Taunton, have formed an association and joined the Knights of Labor.

CONNECTICUT.

Many Swedes employed at the East Haven Wire Mill Co. in place of the members of the Amalgamated Association of Iron and Steel Workers, who have been on a strike against a reduction of wages for nearly six months, have left work because the company refused to advance their pay after increasing the amount of work they had to perform.

NEW YORK.

Otis Brothers & Co. have been awarded the contract for the three hoisting engines for the new furnace plant of the Troy Steel and Iron Co. These engines are their largest size, and are capable of hoisting 3000 tons per 24 hours.

The business heretofore conducted over the name E. W. Bliss, Brooklyn, will for the future be managed by a corporation known as the E. W. Bliss Co. The change has been made simply for the purpose of interesting in the business a number of trusted and faithful employees.

NEW JERSEY.

The Cooke Locomotive Works, at Paterson, have begun work on an order for 24 locomotives for the Minnesota and Northwestern Railroad, and the machine shops of the firm are making silk machinery for the Pioneer Silk Co.'s new mill, at Stroudsburg, Pa.

The first locomotive turned out of the Rogers Locomotive Works, at Paterson, was in 1837. Recently, No. 3600 was sent off. The aggregate value of the whole 3600 is estimated at \$54,000,000. The largest production in any one year was 190, in 1873; the smallest 14, in 1877; average, 75.—*Iron Era*.

PENNSYLVANIA.

The Lochiel Iron and Steel Works, of Harrisburg, were chartered at the State Department last week. The capital stock is \$30,000. The company propose to manufacture steel, skelp iron, railroad iron, railroad supplies and merchant iron.

The Pennsylvania Steel Co., at Steelton, turned out in one day last week 2988 rails. This is the largest amount of work ever turned out by the above company in one day.

The Harrisburg Foundry and Machine Works, of Harrisburg, have received an order from Lexington, Ky., for a 15-ton roller. It is to be completed by the first of February next.

The mines of the Pennsylvania Coal Co. at Pittston have closed for an indefinite period, throwing over 1000 men and boys out of employment.

The Cambria Iron Co., Johnstown, have just shipped a consignment of 73 tons of light steel rails to Milwaukee. They were for the Queen City Street Railway Co.

The Pottstown Iron Co.'s furnace, idle over a year, has blown in. The nail mill and other works of the company have stopped two weeks for repairs. A new roll train will be put in the new nail-plate mill.

It is rumored that J. P. Witherow & Co., who operate the machine shops in Newcastle, will buy the sheet mill from Peter Kimberly. Witherow & Co. have contracts enough on hand now to keep them busy night and day until 1887. They have just commenced the erection of a boiler works, 126 x 80 feet, and will manufacture the Heine patent boiler.

The second stack of the Saucon Furnace, at Hellertown, will be blown in soon.

The Penn Hardware Co., Reading, have added a brass foundry and nickel-plating plant to their works.

The Crane Iron Co., of Catasauqua, have ore properties in Cumberland County, this State, upon which they are prospecting for ore.

The Bethlehem Iron Co.'s blast furnace, at Bingen, was blown out several days ago for repairs. A large number of men are at work relining the furnace, and it is expected the same will be put in blast in about six weeks.

The Hope Rolling Mill, of the Pottstown Iron Co., at Pottstown, which has been lying idle for some time, started up on double turn last Monday.

The Lackawanna Iron and Coal Co. have informed their employees in Scranton that on January 1 their wages will be restored to the figures prevailing six months ago, when a reduction of about 15 per cent. was made.

PITTSBURGH AND VICINITY.

The new 7-ton open-hearth furnace of Emerson, Hammond & Orr, Pittsburgh, will be ready for work in January.

The H. C. Frick Coke Co., of Pittsburgh, have bought the Dillinger Coke Works, at Tarrs. The price paid was not made public.

There will be some important changes in the Carnegie firms, of Pittsburgh, after the 1st of January. The Carnegie Bros.' firms will remain the same, but the Pittsburgh Bessemer Co., Limited; Wilson, Wallace & Co., Limited, and the Lucy Fur-

nace, Limited, will be consolidated under the firm name of Carnegie, Phipps & Co. This company will have charge of all the construction which will go on in connection with these furnaces and works.

Mr. E. C. Long, who has been in Pittsburgh several days endeavoring to form a company to operate his table-ware glass house at Sterling, Wayne County, Ohio, on the co-operative system, has induced eight skilled workmen and two other persons to take \$500 of stock each. The capital of the company is to be \$20,000 to \$25,000. Mr. Long wishes to have 25 to 30 skilled workmen among the stockholders, and expects to complete the number at Wheeling.

Twenty-six nail machines were shipped last week by the Pittsburgh Mfg. Co. to the Steubenville Co-operative Works. The works will be run on three turns of eight hours each, and give employment to 125 men in all.

Messrs. Sheriff & Ashworth, of Pittsburgh, have secured the contract for putting \$5000 worth of machinery in the new nail factory at Steubenville. They will place a 100-horse-power engine and the boilers, pulleys and shafting.

It is rumored that the Ward Axle, Brake and Coupling Co., at Monongahela City, will remove their plant to McKeesport.

Lindsay, Sterritt & Co., Allegheny, are remodeling 400 dozen picks for the gold mines of California.

William Clark & Co., Pittsburgh, have shipped an order of 150 tons of hoop iron to Little Rock, Ark. The shipment was consigned to the Little Rock Cooperage Co.

The American Iron Works of Jones & Laughlin, Pittsburgh, are on double time in nearly every department, making nearly 200 tons of finished iron every day.

Messrs. Totten & Co., of Pittsburgh, have received an order from the receiver of Brown, Bonnell & Co., of Youngstown, Ohio, for a Universal mill. The mill is to be completed and ready to run 60 days from January 1. The cost is estimated at from \$30,000 to \$40,000.

A co-operative glass house is to be started at Rochester with a 12-pot furnace at first and a capital of \$50,000.

OHIO.

The Mahoning Valley Iron Co., Youngstown, have purchased the nail factory at New Castle, Pa., and will put it in operation shortly.

Parties from Beaver Falls, Pa., and Martin's Ferry have formed a company for the erection of a tool works at Burlington. The works will be run on the co-operative plan. A large amount of stock has already been taken.

The Bellaire Nail Works, which have been running steadily for several months, will close down after the holidays for an indefinite period.

It is probable that several of the Ohio Valley flint-glass factories will close down for an indefinite period after January 1.

Thomas Furnace, at Niles, blew in last week.

The plant of the Cleveland Crucible Steel Works, Cleveland, Ohio, which for the past year has been idle, has been leased by parties from Cuyahoga Falls, who are making some alterations and expect to be in active operation during the coming month under the style of the Cuyahoga Rolling Mill Co., a partnership.

INDIANA.

The Indianapolis Car Works have taken a contract to build 500 box cars for the Chicago, Milwaukee and St. Paul road. These cars are to be 34 feet long, and are to have a capacity of 20 tons each.

MICHIGAN.

The Michigan Car Co., of Detroit, are building 500 freight cars for the Michigan Central road, and are also repairing and rebuilding a large number of cars for the same road.

The Mining News of Florence reports that the new furnace of the Iron River Furnace Co. will go into blast within a month.

IOWA.

The Baker Wire Co., manufacturers of barb wire, Des Moines, have just added to their manufacturing facilities a new engine and tower 108 feet high, engine-room, paint shops, &c., at a cost of \$10,000. The new engine increases their steam-power 100 per cent.

The East Dubuque Mfg. Co., of East Dubuque, are incorporated to manufacture agricultural implements; capital, \$100,000.

ILLINOIS.

The Du Quoin Iron Works, Du Quoin, manufacturers of vases, machines, stationary and portable engines, mining machinery, &c., have moved into their new works. The new works are built of brick, are 30 x 50 feet, two stories, with an L 30 x 60, making a frontage on railroad of 90 feet.

MISSOURI.

Hill, Clarke & Co., St. Louis, have just sold to the Dry Docks Iron Works, Fort Huron, Mich., an iron planer 44 inches wide, 44 inches high and 16 feet long. The machine weighs 20,000 pounds.

The Missouri Malleable Iron Co., St. Louis, have added to their list of manufactured specialties a new style of hay pulleys, possessing many advantages over those of the ordinary make.

The Laclede Rolling Mills, St. Louis, have started three more puddling furnaces since going into operation, and have between 125 and 150 employees at work.

We are glad to announce that the Western Steel Co., lessees of the Vulcan Steel Works, of this city, have determined to start the rail mill in the near future. For four months past these works have been running on a product of slabs, billets and blooms. The work of putting the rail department in shape for active operations is being pushed, and everything will soon be ready for starting up. This department was closed down

in February, 1884, when the price of rails receded to a figure very close to, if not below, the cost of production. For three months past the rail market has shown great activity, and there are many indications of further improvements in demand and price. The Western Steel Co. are not members of the combination which has for its object the restriction of the production of steel rails, and will therefore be free to dispose of their output as their managers find best for their interests. The starting up of the rail department will give employment to a considerable number of men, and will not be without its effect on the ore market.—*St. Louis Age of Steel*.

The St. Louis house of the Henry R. Worthington Hydraulic Works have been awarded the contract for supplying the city of Dallas, Tex., with a complete water works plant. Two pumping engines, each of a daily capacity of 3,000,000 gallons, and three 60-horse power boilers will be required, including all piping and details whatever to make a complete pumping plant. The works will be the finest of their kind in Texas.

ALABAMA.

The Montgomery City Council has finally authorized the use of electric motors by the Capital City Street Railroad Co., and the superintendent of the road has gone North to buy them.

The Elliott Motor Co. have been chartered at Mobile to manufacture a motor invented there. The largest size is to be used for running printing presses.

R. W. Boland, of Birmingham, has contracted to do the ironwork needed by the Curry Press Co., of Huntsville, in making their presses.

There is now substantial assurance that when the Memphis, Birmingham and Atlantic Railroad shall be completed to Birmingham it will be met there by an extension of the East and West Alabama road, belonging to the Georgia Central system, from Goodwater.

The newspapers and the public generally now seem to regard the revision, now in progress, of the Georgia Pacific surveys between Birmingham and the Columbus, Miss., division as an actual preliminary to the immediate closing of the gap in the road. On the strength of the promises of this consummation coal lands along the line are already held at higher prices.

Alice Furnace No. 2, at Birmingham, was blown in again on the 27th, having been thoroughly repaired.

A sale made a few days ago of an interest in a tract of land on the Georgia Pacific Railroad, some 5 miles from Birmingham, has started a report that the Richmond and Danville Extension Co., or somebody else allied with the Georgia Pacific, is going to build a furnace on it.

The Smith's Sons Gun and Machinery Co. have bought ground of the Avondale property, just out of Birmingham, and will build immediately.

Hardware Novelties.

A New Weed Hoe.

The Iowa Farming Tool Co., Fort Madison, Iowa, are putting on the market the Iowa Solid Steel Blade Weed Hoe, the form of which and its special features are shown in the cut below. This article, as indicated by the name given to it, has the cutting edge or blade made of one solid piece of steel with the teeth. It is described as made of heavy

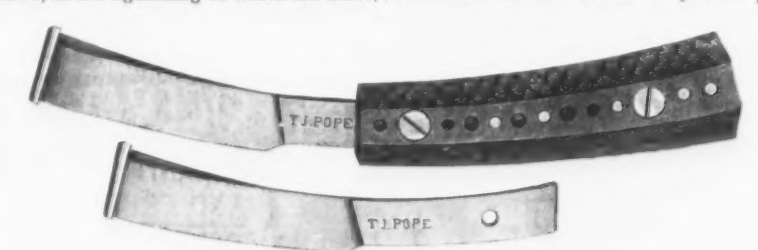


Iowa Solid Steel Blade Weed Hoe.

plate and not thin sheets, as being oil-ground and given a brilliant polish. It is thus claimed to have advantages both in strength and appearance over other weeders.

Pope's Farrier's Knife.

The illustrations which we give herewith represent T. J. Pope's Patent Malleable Handle Farrier's Knife and Blade, which is manufactured by T. J. Pope, Saquoit, N. Y., and for which Wiebusch & Hilger, 84 and 86 Chambers street, New York, have the sole agency from January 1, 1886. The special features of this knife are readily apprehended from the cuts, it having, as indicated, a malleable-iron handle, formed in two parts, which are fastened together by screws, in the tightening of which the blade,



Pope's Farrier's Knife.

when inserted, as shown in the upper figure, is securely held. The form of the blade is shown in the lower one. Among the advantages mentioned in connection with this knife is the fact that a new blade can be inserted in the handle at any time at about half the cost of a new knife. Further points made in its favor are that with it all blades hang alike, as well as the fact that the inconvenience in use resulting from having handles of different sizes and shapes is obviated.

Referring to the growing want for absolute standards in electrical measurements, an English paper very pertinently remarks that "electricians are in the position of the earlier inhabitants, who, lacking foot-rules, measured lengths in terms of grains of corn."

The World's Market.

A writer under the signature "Banker," in one of our commercial journals, remarks in a general way upon the bearing, from an economic point of view, of the recent course of current values, the foreign exchange, wages, &c., particularly noticing the following: "The Bank of England finds it necessary to put up the rate of interest every little while, and further even to maneuver in the open market to secure an artificial activity there. In other words, a machine devised to check overtrading and excessive speculation and so force adverse exchanges into being favorable to London is being used when there is an entire absence of those conditions of trade, although such action must necessarily further depress business already so lifeless." The conclusion of the whole matter, as concerns a wide and varied range of interests, is that a slow but radical change is taking place, arising from certain occult causes as yet beyond the comprehension of ordinary observers, all in the direction of lower prices for commodities of every description and for labor. We quote as follows:

"By new inventions and improved processes the production of everything useful to humanity has been vastly increased and the cost diminished, and we are constantly advancing toward great abundance and low prices. With universal reduction in the price of all things, how can wages and the rate of interest fail to experience a similar fall for the rates of interest and the wages of labor form a very important part of the cost of production of all things necessary to the well-being and progress of humanity. Every one who has something to sell, whether it be labor or the results of labor, regrets to see a fall in the prices of what he desires to sell; but in reality, in the end, if all things fall in the same ratio, the fall in prices, instead of being an evil, is a benefit to all, for each and all obtain a greater amount of enjoyment and useful things with less labor and effort than with high prices. The true question with every one is not what amount of money he obtains for what he sells, but what amount of useful things will he obtain eventually in exchange for what he sells. With limited production and high prices there must be limited enjoyment, whereas with abundant production and low prices there will be abundant enjoyment and progress. Labor cannot expect the same amount of money wages when useful commodities of every kind are low and abundant as when they are high and scarce. It is by the increase of our command of useful things that we are benefited, not by an increase in the amount of money we receive for what we sell. And the rate of interest can never be higher than what money can be made to produce when used in industrial occupations, or in investments in land, houses and sound security. Consequently, the fall in the price of useful commodities and in the rate of interest is not a momentary result, indicative of an unsound condition in human affairs, but on the contrary a permanent result, that is likely to increase."

Another point, and perhaps the most significant in its bearing upon the general subject, should be noticed here. The momentous fact is now everywhere pressing upon the attention of thoughtful men that

Foreign Markets.

FRANCE.

PARIS, December 18, 1885.—*Metals*.—Have been but moderately active, but the tendency has been toward better rates except in Spelter, which is lower. We quote at the close in francs $\frac{1}{100}$ kg.: Copper—Chili Bars, 112.50 @ 113; Ingots and Slabs, 118.75; Best Selected, 123.25; and Pure Corocoro Ore, 115. Tin.—Banco, 257.50; Billiton, 252.50; Straits and Australian, 255; and English, 349; Lead, 20.75 @ 41.75; and Spelter, 30.75 @ 31.75. The iron market here and in France generally has continued during the week in anything but a cheerful condition, and as the Chambers trouble themselves about politics only, and bestow no attention on the important subject of public works, we shall have to wait for the new year to bring us relief. Meanwhile the dealings here and all over France will be even more insignificant than before. We quote Merchant and Beams on the spot 12.75 @ 13 francs $\frac{1}{100}$ kg. The Northern Railroad Co. of France stand in immediate need of 10,500 tons of steel rails; tenders will be received at once. The Western Railroad Co. have sold a large lot of Iron Rails at 6.50 francs, at which figures they are readily taken. In the Haute-Marne there has been some business done on very low terms. Coke Merchant at 12.50 @ 13.50; Mixed, 13.50 @ 14; and Charcoal, 11.50 @ 10.50. Axes in the rough, 15 francs; Wire Nails No. 8, in bulk, 22.50 @ 23.50. The Northern Department has been quiet at 12 @ 14 francs. Merchant, as to size of lots; Beams sold as low as 11 francs; Sheets at 15 @ 17.50. Denain sold Railroad Spring Steel at 19.50. Coal has been active and firm.—*Montreuil's Informations Matérielles*.

BELGIUM.

BRUSSELS, December 18, 1885.—*Iron*.—Nothing has occurred to appreciably modify the situation of the Belgian iron market during the week. While the large works are as usual getting on very well, the smaller concerns are frequently compelled, in order to secure an order, to shade even the prevailing low rates, the general result being a languid, unsatisfactory state of affairs likely to continue at least till February next, when the nearness of the spring trade may bring some relief. Meanwhile the bridging over of the dull winter spell will not be an easy matter for the majority of producers, since there will be few, if any, export orders to speak of; navigation being closed, and the iron country we deal with, Luxembourg Foundry Pig has been selling at 4.30 francs $\frac{1}{100}$ kg., and Puddling do. at 3.90. At Charleroi the respective quotations remain 6.75 and 4.20. Merchant Iron we nominally quote 10 francs for No. 1; Beams, 9.75 @ 10.75, and Sheets, No. 2, 13.

Foreign Iron and Steel Movement in Belgium During the First 10 Months.

	Imports.	Exports.
	1885.	1884.
Tons.	Tons.	Tons.
Iron Ore.....	1,158,675	1,229,815
Cast Steel.....	11	97
Steel Rails.....	286	510
Other Rolled Steel.....	2,575	3,147
Wrought Steel.....	340	482
Pig Iron.....	80,930	105,628
Old Iron.....	15,980	10,442
Iron Wire.....	3,620	4,804
Iron Rails.....	131	418
Sheet Iron.....	738	567
Other Finished Iron.....	4,351	5,452
Nails.....	344	257
Wrought Iron.....	2,357	2,232
Castings.....	408	767
Total.....	1,398,927	1,413,629

Coal is tolerably active and firm.—*Montreuil's Informations Matérielles*.

GERMANY.

HAMBURG, December 18, 1885.—*Iron*.—The market has shown less strength and animation during the week, both in Rhenish Westphalia and Upper Silesia, but it could hardly be expected otherwise so near the close of the year, when people do not feel inclined to increase stocks, but prefer to leave operations in abeyance till balance sheets are drawn and the new year affords them an opportunity to better judge of the immediate future. Although the iron markets are dull at present, there is an undercurrent of faith in the future; there is well-founded hope that toward spring production will be better under control in both iron regions of Germany, and as prices are low, consumers will have no reason to delay replenishing stocks on a liberal scale, and even anticipating requirements. One of the greatest difficulties iron industry has had to contend with this year has been the lack of harmony among makers, which chiefly arose from the vicious system of paying directors of some iron companies pro rata of the output. These abuses are now being abolished, and, after they are out of the way, a better understanding may be had about joint reduction of output and the management of the latter. While on the one hand it is hoped that there will be an end to senseless overproduction and mutual underselling, on the other it is believed that better times await us generally in all next year. Meanwhile there is no change in prices. *Metals*.—Copper has further declined, other metals are unaltered.—*Horseshoe*.

HOLLAND.

ROTTERDAM, December 14, 1885.—*Tin*.—There has been greater weakness during the week, with a decline of $\frac{1}{4}$ guilder. Banca has been done at 65.50 guilders and Billiton at 55.50 $\frac{1}{100}$ kg. Later on holders withdrew their lots from the market, and a better demand bringing up, an improvement all round of a quarter ensued.—*Koch & Fleckenstein*.

RUSSIA.

ST. PETERSBURG, December 15, 1885.—*Iron*.—The Government has made advances to the following works: New Russian Co., Steel Rails, 500,000 roubles; Koloman Machine Shops, 800,000; Several blast furnaces and machine shops, 1,500,000; L. P. Han & Co., 800,000; Malaisk, 1,500,000; and Prince Belosselsky Co., 2,500,000.—*Journel de St. Peterbourg*.

AUSTRIA.

VIENNA, December 18, 1885.—*Iron*.—Nothing has occurred so far to confirm the rumors of a syndicate upon the Siegen, Germany, plan was about to go into existence. It seems that rumors set afloat indicating such purpose were merely spread for stock-jobbing operations in industrial shares on change. The best proof that nothing of the kind is seriously contemplated will be found in the fact that some leading works made contracts during the week selling iron at current rates, deliverable in all 1886. Pig Iron has meanwhile declined to 47 florins. We quote at the close of a dull market: Pig Iron, 47 @ 52; Merchant, 100 @ 125; Sheets, 150 @ 175; and Beams, 100 @ 110.—*Austrian Trade Journal*.

EAST INDIES.

SINGAPORE, November 9, 1885.—*Tin*.—Supplies continue moderate and prices are firm. 334 $\frac{1}{100}$ kg. was touched last week, and now there are buyers, but not sellers, at 330.50 $\frac{1}{100}$ kg. Sales for the fortnight are reported as 291 tons. Shipments last month from the Straits were 600 tons to England and none to the United States; this month they will not be so moderate, 250 tons having already been engaged for New York by direct steamer. Tonnage.—Steamers are in ample supply and rates have declined. Sailing vessels are scarce and rates are maintained. For New York the E. E. Lee and William Hales are still on the berth, and the Willie Reed has arranged to follow. Two steamers are shortly expected from China to fill up for New York direct and are open to book cargo. The Eclipse was a week ago found to be leaking and has begun to discharge cargo; so far the leak has not been found, but Lloyds and Veritas surveyors hope that the damage may be repaired without all the cargo being discharged, and in a short space of time, as the leak does not seem to be serious, For Boston the berth is vacant. Exchange is quoted to-day at 3.6% for six months' sight credit drafts on London. Shipments from the Straits Settlements to the United States during the first 10 months 23,982 piculs, against 25,579 in 1884; 6,194 in 1883; 96,772 in 1882; 75,692 in 1881; and 12,321 in 1880.—*Guthrie, Wood & Co.*

COLOMBO, November 12, 1885.—*Plumbago*.—Dealers have evinced little disposition to entertain proposals for further contracts, since they still have considerable deliveries to make from former engagements. We quote Large Lumps, £12 5; Ordinary, £12 5; Chips, £9 10; and Dist. £6 15, per sail to London, with 1% additional if per steamer, cost and freight.—*Volkart Brothers*.

AUSTRALIA.

SYDNEY, N. S. W., December 3, 1885.—*Iron and Hardware*.—There has been a better feeling during the fortnight, despite an increase of stock during the interval. Galvanized Iron is firm and holding upward, but Fence Wire No. 5 has declined another 10%, and does not now bring over £9 10. Little doing in Pig Iron and Tin Plates.—*Per cable via London*.

Chicago.

Office of The Iron Age, 36 and 38 Clark St.,
Cor. Lake St., CHICAGO, December 28, 1885.

Hardware.—Since our last report jobbers have entered upon a period of quietness, and retailers have served their holiday trade. Nothing of importance will occur in business until the year's accounts have been balanced. Stock-taking and clearing up of the odds and ends is the annual work at this time, and the second week in January will be well-nigh spent before trade moves in its customary channels. The demand during the month of December was well sustained, and the ending of this year compared with the closing of the preceding one is in marked contrast. The general feeling is that the average in profits and tonnage will be something better than for 1884. Higher prices are in prospect, and buyers are already asking figures on goods to be delivered for spring trade. Manufacturers continue to withdraw quotations, and are busy making up new discount sheets. Jobbers have received announcements of some changes that will be made, and many others are expected during the next 10 days.

Barb Wire.—Considerable change has occurred in the market during the last two weeks. At a meeting of the manufacturers held in Chicago on the 17th they adopted the price of 4¢ per lb on Painted Wire in lots of 50 tons, with 1/4¢ additional in less quantities, with 1¢ per lb additional on Galvanized, with the usual 2¢ discount, 60 days, f.o.b. Chicago and East St. Louis. This price was adopted to stand until the next meeting, which will be on the 14th of January, at which time it is likely a further advance will be made. The attendance at the meeting was not large, and the question was raised as to whether it would be adhered to by those not present. Replies since received by the secretary from absentees lead to the conclusion that all manufacturers will concur in the action of the meeting. Jobbers quote 4¢ for Painted and 5¢ for Galvanized, without distinction as to quantities, for present delivery. The demand for Wire continues to increase, and numerous orders are being received for shipments during February and March at present prices.

Nails.—The situation is somewhat difficult to describe at the moment. Jobbers are quoting \$2.50 for Iron Nails and \$2.60 @ \$2.70 for Steel Nails. Usually the trade in this city adheres to one price, but during the past week we have heard of sales of Steel Nails at both figures named. Stocks of Iron Nails are in good supply, with considerable stock offering from Eastern mills for immediate shipment. Upon the other hand, it is said that manufacturers refuse to name prices for delivery beyond January 1. Jobbers are having more inquiry from consumers for spring delivery, and the general indications are that prices will react and become somewhat stronger immediately after the first of the year. Dealers discourage sales as much as possible.

American Pig Iron.—The closing weeks of the year are evidently having no effect upon the buoyancy of the market. The demand continues to be strong and active, and since our last report prices have advanced from \$20.50 @ \$21 for Lake Superior Charcoal Iron to \$22.50 @ \$23.50, four months, present delivery. Some of the furnaces are asking the top figure for the higher grades, while others are making no distinction. The market for Chicago Iron continues so unsettled that scarcely the same price will apply upon any two brands. While it is certain that there is not a superabundance of Charcoal Iron, there continues to be more stress placed upon its scarcity than is justifiable. It is said that there are large blocks of Iron in the market that will be available when prices touch the point that holders are waiting for. Furnacemen differ in their opinions as to the future, and are governed in making sales largely by the class of consumption they serve and the possible demand of that line of trade. Within the last week one order for 1000 tons, Eastern shipment, May delivery, was refused at \$23, while a number of sales of smaller lots were made at that figure. While the whole line of Pig Iron continues to be firm, not so much advance has occurred in Lake Superior Coke Irons, which are quoted at \$19 @ \$20, and Cinder Mixed, \$18 @ \$18.50. Ohio Standard Blackbands vary in price, after the manner of Charcoal, Brier Hill being quoted at \$22 in small lots, orders only acceptable when confirmed by furnaces before closing sales. Hubbard is quoted at \$20 for No. 1, and \$19 for No. 2; Hazleton, \$20.50 for No. 1; Southern No. 1, \$19 @ \$19.50; No. 2, \$18 @ \$18.50; No. 2 1/2, \$17 @ \$17.50; No. 1 Mill, \$17.25, and No. 2, \$16.75. Through private advices we learn that some of the Southern furnaces have been selling Iron quite freely in the last 10 days, while we understand that others decline to make sales at any figure for future delivery. Some claim that they have no Iron to sell, while others are asking prices which they know they cannot obtain at this time. There is likely to be an increased supply of Southern Iron shortly after the first of the year from furnaces going into blast, among which are the Dayton, who will be represented by Chas. Hiram & Co., of this city. It is said that another 50¢ per ton advance will be made January 1.

Merchant Steel.—Jobbers of Merchant Steel report business dull at present, though they claim to have quite a number of orders booked for delivery during January and

February. Prices are gaining strength slowly, particularly so on the Open-Hearth Steels, which have been advanced in quotations on the lowest grades to 2 1/4¢. With the stiffening up on the lower grades prices have become firm on the better class of Steels, and it is said that concessions are less frequent and quotations more closely adhered to. Low Grade Tool Steels are quoted at 7 1/2¢; Ordinary, 8¢ @ 9¢; High Grades, 9 1/4¢ @ 13 1/2¢, with Specials ranging up to 20¢. Crucible Steels are said to be firm at 4 1/2¢ @ 5¢, while some manufacturers of Plow Steels have advanced their quotations 1/4¢, making the price 5¢ on patented Plow Steels, and pretty closely adhered to by all manufacturers.

Steel Rails.—No change has occurred in this market on Steel Rails. The Youngstown syndicate who have leased the works now known as the Western Steel Co., at St. Louis, are preparing to roll Steel Rails. They will have a capacity of 200 tons per day, and are the only mill outside of the present combination.

Structural Iron.—The market is quiet. No changes in quotations are yet announced on shapes for delivery during 1886.

Plate and Tank Iron.—A fair trade in small lots has continued during the last two weeks, with here and there an order for several hundred tons. Our quotations are unchanged.

Bar Iron.—Makers and jobbers claim that there has been a marked improvement in the lower grades in the last 30 days. The lowest prices have been abandoned and quotations which are now made are said to average \$3 a ton higher than they have obtained heretofore during this year. On New Puddled Best Refined Iron 1.80¢ rates are more general from all classes of buyers, and concessions on this quality are exceptional and chiefly on lots running into carloads. Common Iron is quoted at 1.70¢ rates from store, while a strong effort is being made to secure the same figures that are asked for New Puddled Iron. It is evident that jobbers will find it necessary to obtain these prices if they would save themselves from loss on transactions. Mills decline to sell Iron at less than 1.70¢ rates, base sizes, f.o.b. Chicago, as a rule, though there are one or two low-priced makers who would perhaps shade this price a fraction on Old Rail Bars which they have on hand. The demand has not been very brisk for any class of Iron recently, though numerous specifications are out on lots that will be required early in the year, and it is predicted 2¢ will be asked by makers of the best grade of Iron on most of these inquiries.

Old Rails.—There has been an extra good demand for Old Rails in this market for some time, and the price has advanced with exceeding rapidity. A number of small lots changed hands at \$21.50, and this price is freely offered on quantities ranging up to 1000 tons. The price, however, does not seem to be sufficient to bring out the stock, and we hear of holders asking \$23 per ton. The N. C. R. M. Co. are quoting \$20, Milwaukee, while \$23.75 has been paid at Youngstown. Old Steel Rails are quoted firm, and \$18 bid on mixed sections.

Galvanized Iron.—Jobbers in Galvanized Iron report a reasonably good trade for the season. Buying is almost entirely in small lots, with now and then an order of 10 to 20 bundles from railroads and other heavy consumers. Jobbers continue to quote 57 1/2¢ off on Juniata and 57 and 10¢ off on Charcoal.

Old Wheels.—The market for Old Wheels has been more than usually firm in the last 10 days. Numerous inquiries have been made for lots ranging from 50 to 300 tons, on which \$16.50 seems to be about the outside price bid by consumers. Holders are asking from \$17 to \$18.

Scrap Iron.—There has been more than the usual demand for Scrap in the last few weeks and closely selected No. 1 Wrought is now quoted at \$19 @ \$19.25. Buyers do not consider this to be the market value and are not inclined to pay within \$1 a ton of the prices demanded. No. 1 Mill is quoted at \$15, No. 2 at \$9.50, the demand, however, not being so strong as for the other grade. Old Car Axles are quoted at \$22.50. We make the following quotations as dealers' purchasing prices: No. 1 Wrought, \$14; Machinery, \$13; Stove Plate, \$8.50; Steel Tires and Wagon Springs, \$13; Old Plows and Plow Steel, \$9; Wrought-Iron Turnings, \$9; Cast-Iron Borings, \$7.50; Malleable Scrap, \$6.50.

An Attempted Sale of an American Iron Property in England.—A writer in the *Tribune* is responsible for the following: "I heard yesterday a story that illustrates how the English capitalists are frequently 'taken in' by Americans, but how one syndicate was saved from a ruinous investment. A Connecticut iron-maker, having a fair property and a small plant, conceived the idea of making a sale of it to Englishmen. He had all sorts of letters of recommendation and certificates of the character of the property made out, and sailed across the water on his mission. He formed a company and negotiated a sale. The price agreed upon was \$1,750,000. The transfer was about being made when one of the Englishmen got a cablegram saying that an important letter would reach him from his New York agent by the next steamer, and not to make the agreement until the letter arrived. The missive contained a copy of a document on file in the public records of the county in which the iron furnace was located. It was an affidavit made by the pro-

prietor. It stated that whereas the assessors had valued his property at \$50,000, and whereas this was largely in excess of its value, the affidavit was prepared so that its true value of \$40,000 might be sworn to and be placed on the records as the assessable value, instead of \$50,000. The affidavit was read to the man who had almost inveigled the Englishmen into paying nearly \$2,000,000 for this property, and the bargain was declared off. The Englishmen sent a handsome present to their agent here, who had prevented them from being swindled, and so the matter came out."

A new process of forming scissor blades has been patented by H. T. Russell, of Chicago, Ill. A cast-steel blank of a somewhat full size is heated and subjected to pressure between two dies. The effect of the compression is to condense and refine the metal, and to force out the surplus toward the cutting edge or back of the blade in the form of a flange or fin. This fin is removed by grinding or shearing, after which the blade is completed. The inventor says that scissor blades produced by the above process are cheaper than malleable iron blades having steel cutting edges welded thereto. This arises from the absence of loss from imperfect blades and also from the absence of the welding process.

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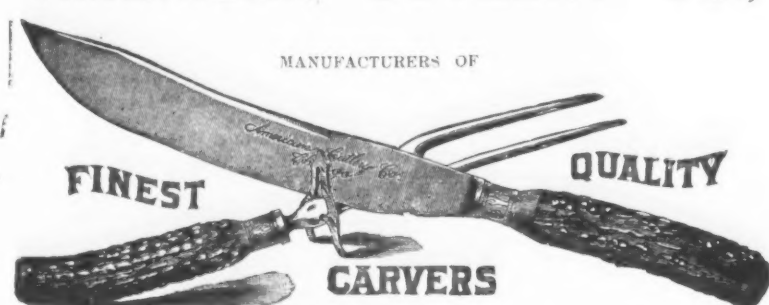


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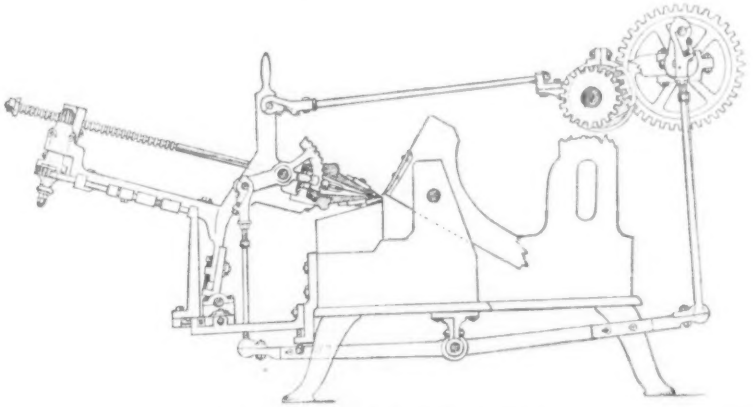
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MECHANICAL.

The McKim Nail-Plate Feeder.

Mr. G. W. McKim, of Martin's Ferry, Ohio, has recently introduced a new nail-plate feeder which is spoken highly of by the Bellaire Nail Works, who have been testing it. The accompanying illustration will convey an idea of the mechanism and its method of working. The plate-holding barrel shown in section as resting on the anvil receives its turning motion through the agency of spiral cogs which are engaged by a pinion which is provided with spiral cogs only over a part of its periphery. Reciprocating motion is given to the feeding barrel by the following arrangement: On the main driving shaft secured on the frame of the machine is an eccentric. Through the intermediary of a connecting-rod this operates a rocker arm, journaled as shown. To the upper part of this rocker is attached the turning feeding barrel, which thus receives the motion which alternately brings the feeding barrel from and toward the anvil. The rotary motion of the feeding barrel is accomplished in the following way:



THE M'KIM NAIL-PLATE FEEDER.

Upon the main driving shaft, the same upon which is the eccentric already alluded to, is a pinion which gives motion to the gear-wheel back of it, revolving once to every two revolutions of the pinion of the power shaft of the nail-cutting machine, thus revolving the nail-plate holding barrel one-half of a revolution to one of the power shaft. From this larger wheel the movement is transmitted through a crank-pin and a pitman to a lever fulcrumed as shown to the lower part of the frame of the machine. To the other end of this lever is attached another pitman, which conveys the motion to the feeding barrel. The feeding device is shown at the left of the drawing. A rod journaled as shown is struck every time by the rocker, and moving a ratchet-wheel gives a forward movement to the feeding barrel. The teeth on the ratchet-wheel are a fraction more than the size of the nail which is required to be cut. To compensate for this fraction of overfeed a disk is rigidly fastened to the vertical shaft, near its lower bearing. This disk is provided with a capped recess to receive a leather washer which engages in friction with the upper surface of the ratchet-wheel. The lower end of the vertical shaft is threaded and provided with a flanged nut, and between the lower surface of the ratchet and the flange nut is placed a leather ring similar to the one on the upper side of the ratchet. The latter is bored to turn loosely on the shaft, and by screwing up the flange nut the required amount of friction is obtained. Thus, by this latest arrangement, recently adopted by Mr. McKim, he secures a uniform feed. Mr. McKim calls attention to the circumstance that his nail-feeder overcomes the difficulty experienced in feeding large nails, from six-penny up. He claims that it will feed 20 per cent. more nails than can be accomplished by hand-feeding.

Rotary Engines.

Referring again to the subject of rotary engines, the *Engineer* of recent date supplies the following interesting contribution: One of the earliest rotary engines was that in which a cylindrical eccentric was secured to the main shaft and made to revolve in a fixed cylinder, the axis of

seen that the reciprocating piece is not dispensed with, and that, from the way in which its movement is caused, a great deal of wear must take place at the end against which the eccentric cylinder rubs. Again, the number of parts entering into the composition of this engine is as great as that of those entering into that of the simple reciprocating engine. In the first place, there is the reciprocating piece working in the cylinder frame, which we may consider to correspond to the piston and rod working in its cylinder; there is also the eccentric cylinder and shaft, analogous to the crank-shaft of its rival; there remains, therefore, the connecting-rod of the latter to meet by an equivalent piece of mechanism in the former. As regards this latter point, it must be allowed that in some of the engines of the above description this piece is quite dispensed with, but at the same time the inventors have been obliged to use a joint of a most insufficient character. The junction between the reciprocating block and the eccentric cylinder is of such a nature that the curvature of the eccentric presented to the block is continually varying in position, and therefore the junction cannot be more

than a mere line. Such a rubbing surface ought not to be admissible when leakage has to be prevented and wear reduced; in high-speed engines it would be absurd. Supposing this defect remedied, a new piece would have to be introduced, a piece so constructed as to fit fairly with the reciprocating piece and at the same time allowed to oscillate sufficiently to press fairly against the revolving cylinder to suit its varying position. Such a piece is introduced in the engines of Napier. The engine being thus completed, the new piece added is evidently that corresponding to the connecting-rod of the reciprocating engine.

In the engine of Simpson and Shipton we have an apparently simple combination of parts, but yet it has a reciprocating piece in the swinging chamber, and counts up as many limbs as the ordinary engine, except where an incomplete joint is suffered. As with the previous class of engines, a shaft is provided with an eccentric cylinder, and made to revolve in an oblong chamber whose major axis always passes through the center of the eccentric cylinder. This chamber is made sufficiently long to allow the eccentric piece to work freely inside. That it may accommodate itself to the various positions of the revolving gear it is suspended from a joint, and is therefore capable of an oscillating movement. The pin about which the swinging chamber oscillates is secured to a framework, in which are provided the bearings for steadying the main shaft. Steam entering by suitable channels alternately above and below the eccentric cylinder compels the mechanism to be set in motion by enlarging the chamber to make space for itself. The engine is thus composed of the swinging block oscillating on its pivot, and the shaft constrained in its bearings, the two pairs being connected together by the suitable shaping of the chamber and eccentric piece. In this case a piece is saved, but at the expense of having to rest contented with such a steam-tight joint as can be afforded by two pieces touching each other in a straight line. If efficient jointing is provided no simplicity would occur in this engine, so far as the number of parts entering into its composition is concerned. Every one must admire the ingenious

of the shaft has been made, and as at the end of a complete revolution it is back again from where it started, it seems hardly possible to say that reciprocation is avoided. The motion is disguised to some extent by the fact that what may be termed the ends of the chamber are continually altering their position, but relatively to these movable ends the movement is plainly reciprocating.

A modification of this engine, invented by Fielding, shows more distinctly the existence of a definite reciprocating movement. The inclined revolving shafts and the intermediate rocking piece employed in the Tower engine are reproduced in principle in the Fielding engine. But in the Fielding engine the pairing of the rocking piece to the shafts is obtained by fitting it with pistons playing into cylinders constructed on the revolving shafts themselves, the cylinders being curved round in such a way that these axes are circles having their centers at the point of intersection of the inclined shafts. The whole piece of mechanism is set in motion by the action of steam forcing the pistons forward and backward in their respective cylinders. Here, relatively to the revolving cylinders, the motion is still reciprocating, and any one inclined to lower the character of these engines might say that, after all, they have not done away with the objectionable movement complained of in the ordinary engine, and have, into the bargain, managed to introduce two revolving shafts instead of the only one of direct use. This would be nothing more, however, than a superficial opinion, for, considered as pure pieces of mechanism, both the Fielding engine and the Tower engine contain just the same number of working pieces as other engines. Both these engines have dead points, and both halves of the rocking piece are at the ends of their reciprocations at the same time; therefore it should be compared, in estimating the number of its parts, with the single-cylinder engine. In this engine we see there are four pieces paired together—the piston and gear, connecting-rod, crank-shaft and the main frame in which are secured the cylinder and steadying bearings. In the Tower engine there are two shafts, one rocking piece and the frame holding the steadying bearings, thus making four distinct pieces. The pairing of the rocking piece with the spherical chamber is in addition to that required for the mere mechanical movements, as also are two of the perpendicular joints on the rocking piece; the first required for chambering, the latter for stiffness. If the inclined-shaft engines be compared to a double-cylinder reciprocating ordinary engine, the two piston-rods of which are rigidly secured together, and in addition the two connecting-rods secured so as to be virtually in one piece, then the principal difference existing between the two is that whereas in the one two shafts are used and one cylinder, in the other there are two cylinders and one shaft.

A feature consequent upon the reciprocating movement always required in fluid pressure engines is the existence of dead points. No engine has yet been constructed that has not this difficulty existing at those times when the reciprocating piece is at the end of its travel. If it is claimed for any engine that there are no dead points, this must be considered to mean that special arrangements have been introduced by which the natural dead points are passed over; for, in the operation of causing the reciprocating piece to pass backward and forward in its chamber, its movement at each end of the stroke must be reversed, and therefore at the end it must be brought to rest. At that particular instant the steam pressing on the piston may be at its greatest pressure; yet whatever tendency there is on the part of the piston to move will be as much to carry the shaft back through the half-revolution it had already made as in the direction necessary to produce a continuous revolving action. Dead points occur not only in fluid-pressure engines, but also in any motor in which the moving force is of a reciprocating character.

In all rotary engines the dead point exists, and can only be overcome by attaching a fly-wheel to the revolving shaft, or by adding a second engine or chamber, so that the reciprocating pieces may not be on the dead points together. In the Tower engine, though there is a double action going on in each of the two divisions of the spherical chamber, as the action is such that the reciprocating pieces are at the ends of their respective chambers together, there still remains the dead-point difficulty. To this engine, however, must be given the credit for packing all the essential mechanisms into a very narrow space, and hence it has great merit for compactness; but yet, as we have seen, it has just the same difficulties as the common engine and contains just as many moving parts. Very similar remarks apply also to the Fielding engine. So many engines of the rotary description have been constructed that it seems quite superfluous to suggest another, but, even though many are condemned as impracticable, it is interesting to note the various forms they may take.

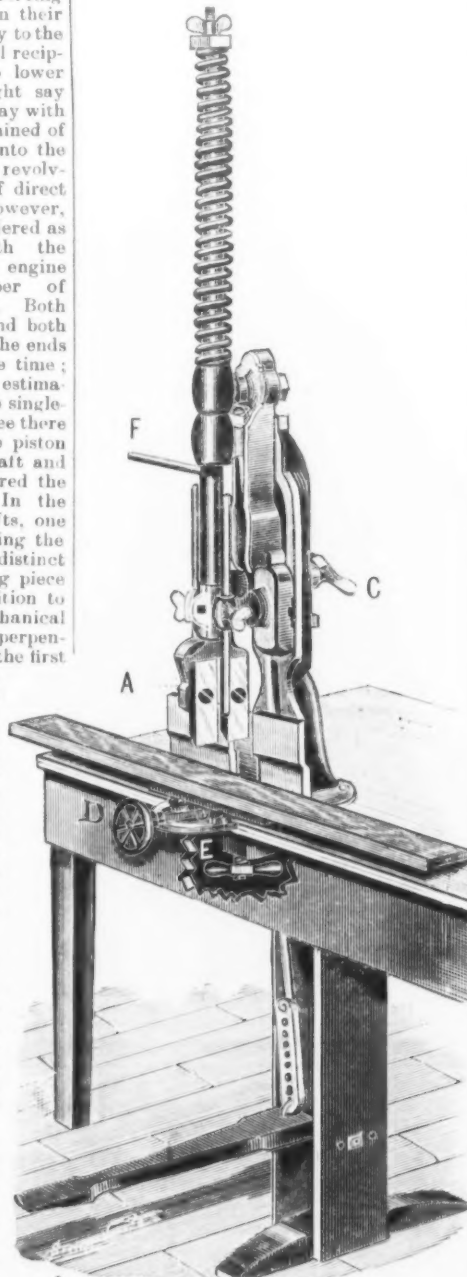
Fuel Economy in Locomotives.

It is a noteworthy fact that practices which have long been recognized as prejudicial to economy in stationary-engine running are permitted to continue in locomotive management without apparent cause. Among several, that of throttling the steam supply to the cylinders as a means of regulating the work to be done calls for increased attention and might easily be abolished, to the great benefit of the expense account. Automatic cut-off engines of the present day have conclusively demonstrated what advantages are to be derived from such a course, and make it appear all the more curious that locomotive engineers as a body have not become impressed with the importance of keeping the throttle wide open, and of regulating the speed by the reverse lever. Instances are not lacking where great differences of fuel consumption in different locomotives were traced directly

to the manner of handling the throttle-valve, and cases where especial facilities had been provided for the working of the reverse levers showed that the results were of the most satisfactory character. In the light of such experience it is but reasonable to expect early and decided reform in this direction. Arrangements which would encourage the use of the reverse lever and the abandonment of the throttle-valve for purposes of regulation would not be difficult to effect, and would soon exert a marked influence on the coal records of the engines.

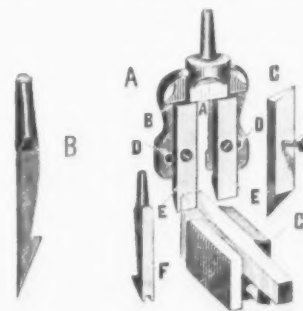
A New Foot-Power Mortising and Tenoning Machine.

The following illustrations show details and general view of a new mortising and tenoning machine combined, designed and built by Louis F. Parks, 272 Colerain avenue, Cincinnati, O. The machine may be set upon any work-bench, occupying but very little space, and is adapted for any ordinary work. Its special advantages are the readiness with



New Foot-Power Mortising and Tenoning Machine.

which the mortising or tenoning tools can be adjusted to cut different widths and thicknesses of stuff. To adjust tools for different widths of stuff it is only necessary to loosen the thumb-screw C at the back of the iron frame, which permits the mandrel to be raised or lowered to any desired height. It is held firmly in its proper position by simply reversing the motion of the thumb-screw until tight, while to adjust tools for different thicknesses of stuff the wheel D turned from right to left, or vice versa, moves the guide-plate to the required position. The knives can be set to various angles, if necessary, by loosening the thumb-screw C and tilting the mandrel sideways. The latter is reversed by means of the handle or lever F, the tension of the large steel coiled spring forcing it into small notches cut or cast into each side of the sleeve bearing above it and hold-



Details of Foot-Power Mortising and Tenoning Machine.

ing it firmly in place. The tools are bolted to a yoked body-piece, as shown in the illustration, having stamped on its outward face a scale or series of gauge marks. To cut different thicknesses a shoulder is cut in the upper portion of yoke-piece, against which the blunt ends of the tools are squared. All parts are adjusted from the front and so made as to not readily get out of order. Bevel chisels specially adapted for sashwork, blind-slat chisels, or any form of tool required for work to be done with this machine, may be used, and by the use of which the manufacturer claims work can be turned out cheaper and much more conveniently than by other methods.

Heat Waste in the Chimney.

Replying to a correspondent's inquiry as to how much of the heat of coal goes up the chimney in fair practice, the *Boston Journal of Commerce* says: For 1 pound of coal of average composition there are 11.94 pounds of gaseous products, of which the mean specific heat is 0.246, and it will take $11.94 \times 0.246 = 2.935$ units of heat to raise them 1° F. Supposing the final temperature of the flue to be 400° , we shall have raised the products of combustion from the temperature of the room, say, 60° to 400° or through 320° , and they will thus carry to the chimney $320 \times 2.935 = 939.2$ units of heat, which, allowing 14,320 units as the total heat of combustion of 1 pound of such coal, would be a little over 6 1/2 per cent. This calculation is upon the assumption that only sufficient air is furnished to chemically consume the coal, but in practice a large amount of surplus air is drawn through the fire, heated and sent off up the chimney bearing its quota of heat. If surplus air equal in quantity to the air chemically consumed be admitted to the furnace, the total weight of the gases for 1 pound of coal is increased to 22.64, having a mean specific heat of 0.242, and $22.64 \times 0.242 = 5.478$ units of heat for 1° F.; $320 \times 5.478 = 1752.96$ units, which equals almost 12 1/4 per cent. of 14,320 units supposed to be evolved. In the above calculations the combustion has been assumed to be perfect and all possible heat evolved, and the terminal temperature reduced to the lowest economical point. By incomplete combustion, or too rapid combustion with reference to the heating surface, it would be possible to discharge a very large proportion of the heat value of the coal into the chimney. In good practice the loss from this cause and radiation will probably approach 15 per cent.

A Gas Engine Water-Supply Alarm.

A very useful contrivance for the purpose of reporting automatically the failure of the water supply to a gas engine has been arranged by Prof. Ph. Carl, of Munich. What led to the adoption of the device was that during last winter the water supply in the neighborhood of the Professor's laboratory was several times cut off without previous notice, the result being the failure of the water needed for cooling the cylinder of his Otto gas engine. On inquiring into the matter he discovered that the same thing frequently occurred in other places where gas engines were in use, and this caused him to design a contrivance to put an alarm-bell into action at the instant when the water ceased to flow, and so enable any overheating of the engine and resulting injuries to be prevented in time. The arrangement, represented half-size in the annexed engraving, which we take from the *Journal of Gas-Lighting*, is screwed down directly to the



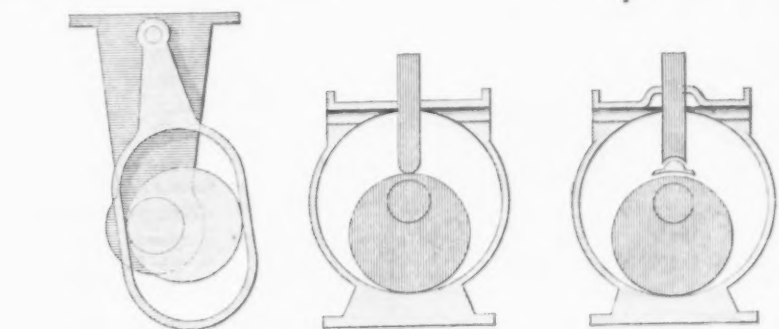
Water Alarm.

water outflow-pipe R. Before the aperture of the pipe is a lever with a disk on one arm, on which the issuing water impinges, keeping the lever in the position indicated by the dotted lines. The effect of this is to break the platinum contact at C, and so interrupt the circuit of an alarm-bell placed in any suitable position. Suppose the water ceases to flow; the spring F comes into play, contact is made at C, and the bell continues to ring till some one comes to stop it. It is almost needless to remark that the disk D and the pin E are composed of insulating material, such as vulcanite.

Anti-Incrustation Compounds.

The most effective anti-incrustation compounds for boilers are those containing tannic acid. Nutgalls, logwood and similar substances rich in this acid may, accordingly, be recommended. It is preferable, however, not to introduce these materials into the boiler in the solid form, but to use the extract instead, made by boiling them in water, for the reason that chips and other solid fragments are liable to find their way into the cocks and tubes and choke them. The usefulness of these materials depends on the fact that the tannic acid which they contain forms, with the lime, magnesia, &c., of the feed-water, basic tannates, which compounds are of a loose or flocculent nature, and do not form adherent deposits on the tubes and sheets of the boiler. These materials have the advantage that they do not injuriously affect the metal of the boiler. Mucilaginous, saccharine and fatty substances, such as potatoes, starch, bran, molasses, tallow, oils, &c., have been recommended by many, but their use is more or less objectionable, since they are not only less effective than tannic acid, but are all liable to cause frothing. By far the most desirable thing to do, where it is feasible, is to purify the feed-water before it is admitted to the boiler, and thus avoid the liability of scale formation and the necessity of using measures to cure it. The use of a properly-constructed feed-water heater and purifier will go far toward checking this evil, if, indeed, it will not entirely prevent it.

European immigration to Buenos Ayres and the River Plate countries continues very large, and comes from Italy mostly. In 1882 there were 51,000 arrivals; in 1883, 63,242; in 1884, 96,000, and during the first five months of 1885, 55,000. If the monthly average of 11,000 keeps up till the end of the year, and it is expected to, the total immigration for 1885 will be over 130,000. The immigrants are nearly all agriculturists, and at once upon their arrival go into the interior, where they settle upon Government land, which they can rent for 10/ or 12/ an acre.



The Simpson and Shipton Engine. Yule's Engine. Napier's Engine.

ROTARY ENGINES.

which coincided with the axis of the shaft, and against whose internal surfaces the eccentric cylinder touched sufficiently to prevent steam passing from one side to the other. Radiating from the center of the shaft, and extending from one end of the cylinder to the other, was a reciprocating block. This block, while always pressing against the revolving eccentric piece, rose sufficiently to allow the eccentric to make a complete revolution. The internal space was therefore kept divided into two by the rising and falling block. Into one division steam was made to enter, and by its force urge round the eccentric and shaft, at the same time expanding into the larger space formed; the other division was opened out to exhaust. Upon this pattern, which most will recognize, are based the engines of Yule, Hall and Napier. In this it will be

spherical engine invented by Mr. Tower, and, though this admiration might be somewhat lessened after having compared it with other engines of a similar character, it still is a wonderful production, not on account of having discovered a short road to rotary motion, but by reason of the close packing of the necessary pieces and movements. It is wrong to suppose that in this contrivance the natural reciprocating movement is at all dispensed with; many who judge of the engine principally from its exterior, and who have not carefully examined the working parts, are inclined to suppose such motion is avoided; even the manufacturers themselves in their prospectus claim as one of its advantages that it has no reciprocating action. As, however, each semi-circular half of the peculiar piston is at one end of an inclosed space at one part of the revolution of the main shaft, as it is at the opposite end of the chamber after half a turn

* See *The Iron Age*, December 3, 1885.

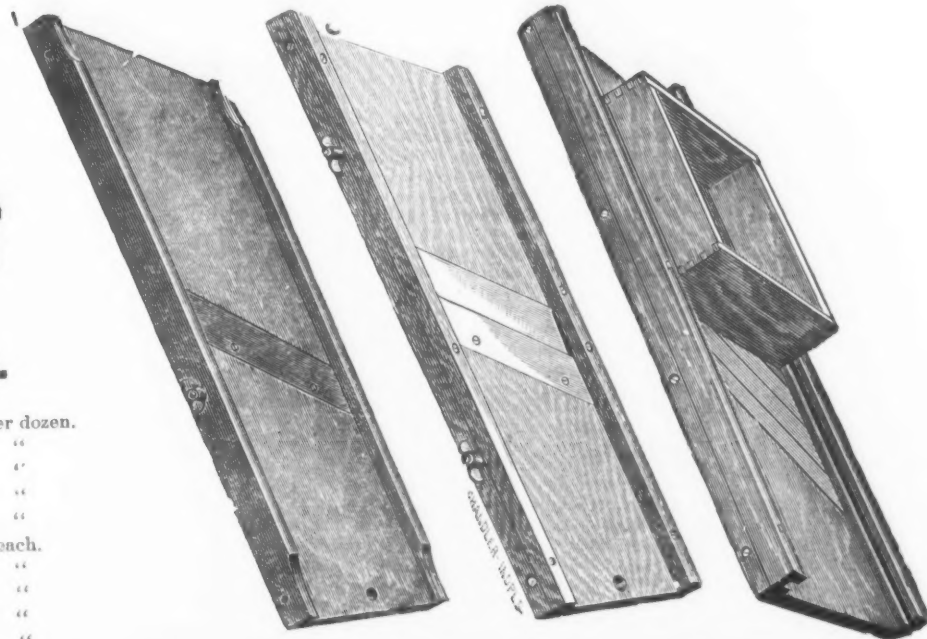
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" 2.....	2 knives, " " " "
" 3.....	3 " " " "
" 4.....	4 " " " "
" 5.....	3 " " 9 x 30, " "
" 6.....	2 " " 12 x 36 each.
" 7.....	3 " " " "
" 8.....	4 " " " "
" 9.....	3 " " 12 x 40, " "
" 10.....	4 " " " "



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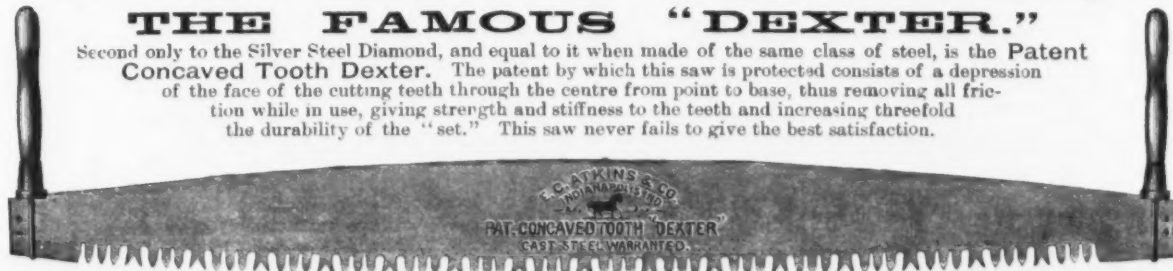
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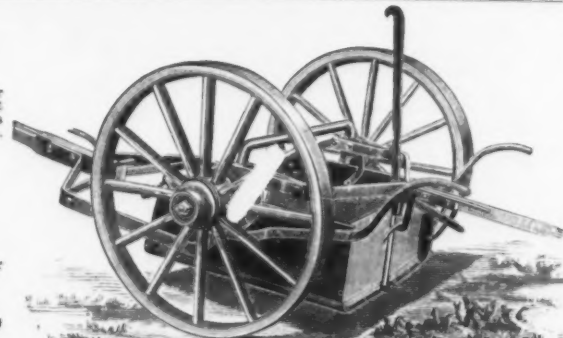
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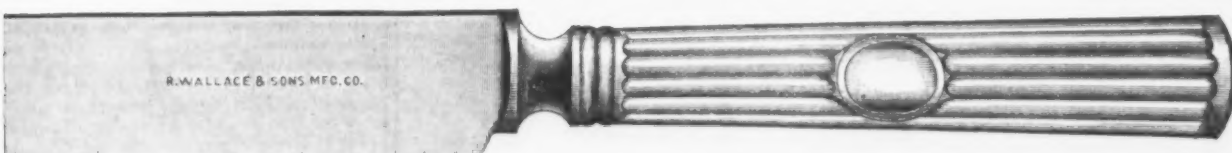
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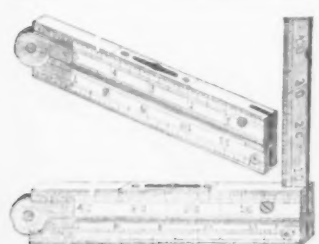


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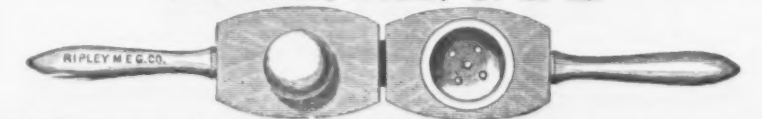
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English Letter.

(From Our Regular Correspondent.)

LONDON, DECEMBER 14, 1885.

THE WEEK

has been dull from a business standpoint, and not very lively in any other respect, despite the severity of the weather up to a couple of days ago. The sharp frosts were the cause of much animation in the skate trade while the ice lasted, and the stocks which had accumulated during the past four years were largely depleted; but in this country skating is a most uncertain pastime; consequently, nobody was particularly surprised when the thaw set in. This little sport has been the only item of interest since my last report, as the elections are now virtually at an end and the political fever of the past few weeks has passed away, leaving behind it only a melancholic sort of expectation as to what may or may not happen when the House of Commons meets in January. The mischief done to retail business in all parts of the country, however, has been enormous, and it is now too late in the year for the defection to be made good. Travelers have been unable to get the shopkeepers to give out orders at all, so that the manufacturers have been deprived of a great deal of business proper to the season of the year. There is now some talk of another general election next year, but that is more speculation, since it only needs a dexterous combination of the Liberals and Parnellites to bid defiance to the Conservatives and to hold Parliament together for four or five years. Whether or not that combination will be effected I need not waste time and space in surmising, but in any case it is to be hoped that we may be saved from the hurly-burly of another general election next year.

The death of Mr. Vanderbilt has caused some speculative gossip here as to whether that event will in any way interfere with the contracts for steel rails into which he had but just entered at the time of his decease. Mr. Vanderbilt is known to have bought 10,000 tons in a line from the Barrow Co., and it is rumored that he had also purchased other 20,000 tons in this country, but at the time of writing I am not able to fully confirm the report. As regards the English rails bought by the Chicago, Burlington and Quincy road, I believe I am correct in stating that the chief engineer of that line has always manifested a marked predilection for rails made in this country. He was in England last year, and it was then commonly reported that his business was chiefly connected with the inspection and purchase of rails. The recent contract fully confirms that view.

An event of great importance to the British hematite iron smelters is the sale of Spanish pig iron to American buyers. Various rumors have been in circulation on the subject, but the following from *The Ironmonger* appears to give the exact facts: "The second event is a contract made by the Vizcaya blast furnaces for pig iron for the United States. The price is supposed to be under 42/6 f.o.b. here. The quantity has been stated as 30,000 tons, but the fact is that only 5000 have been taken, with option for buyers to take 15,000 more if the first 5000 are found suitable, and a further option to extend the contract to a total of 30,000 should they find it to their advantage to do so. Deliveries are to be spread all over the year 1886. This practically means that buyers have provided against higher rates for next year, when they will certainly take the whole quantity contracted if they cannot better themselves; whereas, in case of lower rates prevailing next spring or thereabouts, it is open to them not to go beyond the first 5000 tons on this contract." The price mentioned is one with which our smelters could not compete, and their only consolation is that the Spanish blast furnaces cannot at present turn out any large quantity of pig iron. The contract seems to have been very astutely made by the buyers.

SCOTCH PIG IRON

is quiet, but moderately steady, the more favorable shipments being sufficient, apparently, to counteract the effects of the very unfavorable statistical position and outlook. There are now 92 furnaces in blast, as against 95 a year ago. In Connal's stores there are 655,883 tons (an addition of 4384 tons last week), compared with 579,408 tons this date, 1884. Shipments to date are 85,300 tons behindhand, while the importations of Middlesboro' pig into Scotland have increased by 92,732 tons. Current rates are:

Deliverable alongside.	No. 1	No. 2
Gartsherrie, at Glasgow.....	46/	42/6
Coltness, ".....	50/6	46/
Langloan, ".....	47/6	45/
Summerlee, ".....	50/6	46/
Caldar, ".....	51/	48/6
Carnbroe, ".....	45/6	43/
Clyde, ".....	46/	43/
Monkland, ".....	43/	41/
Quarter, ".....	42/9	40/
Govan, at Broomielaw.....	43/	41/
Shotts, at Leith.....	47/	46/6
Carron, at Grangemouth.....	51/	47/
Kinnell, at Bo'ness.....	43/6	43/
Glenarnock, at Ardrossan.....	46/	42/6
Eglinton, ".....	45/	39/6
Dalmellington, ".....	44/6	41/

John E. Swan & Brothers, Limited, quoted selected Carron at 58/6 3/4 ton, c.i.f. New York.

MIDDLESBORO' PIG IRON

is perhaps a shade easier for prompts and early deliveries, but much caution is being exercised as to distant futures, in view of the possible further reduction of the output, the chances of a reaction after Christmas and the unprofitable nature of present values. The current rates for G. M. B. pig iron, f.o.b. at makers' wharves in the Tees, net cash 10th of following month, less 2 1/2 %, are as under:

No. 1 Foundry.....	35/	Mottled.....	31/
" 2 ".....	34/	" White.....	30/6
" 3 ".....	32/6	Refined metal.....	50/
" 4 ".....	32/	Kentledge.....	35/6
" 4 Forge.....	31/6	Cinder.....	30/

THE IRON MARKET

is quiet, and seems certain to remain so during the remainder of the year. At Glasgow there has been a tolerable amount of business in warrants, but values have not varied largely, the closing price being 42 3/4 ton. Special brands of Scotch pig iron

have been almost unchanged. The reserve stocks are still increasing very freely, and promise to be by far the heaviest on record by the end of the year. Shipments are a little better, but the total for 1885 will compare very badly indeed with that for 1884. At Middlesboro' the market is a shade less firm, and No. 3 foundry pig is quoted at about 32/3 for prompts, and about 6d. more for the early months of next year. The question of a further restriction of the production in the Cleveland district has not yet been settled, but it is understood that the existing arrangement will be renewed and in all probability extended. On the West Coast hematite pigs are firm, and mixed numbers may be called about 45/ 3/4 ton, with rather more money for near futures, and a disinclination to sell far forward. Several contracts are said to have been made for the United States—a remark which applies also to 20 1/2 spiegel. In the other smelting districts there has been no change worthy of note, and no great amount of new business is being transacted, although there are numerous inquiries for next year's deliveries. In heavy manufactured iron I have to report a fair turnover at some of the works devoted to engineering, railway, bridge and other heavy work, but no special activity elsewhere. The fencing-wire branch is dull and values are irregular. In galvanized-iron sheets there is a large production, but prices are nominal and the business is reported to be much disorganized by the development of the consignment system in connection with the Australasian markets. Ordinary finished iron is unaltered in almost all respects, the best employed concerns being the sheet mills. In old materials quotations are about as last week, with a steady market and firm views on the part of the holders of old rails. Freight rates are rather firmer in some cases, pig iron by ordinary steamers, Glasgow to New York, being 7/6 @ 10/ 3/4 ton. In reference to the British Channel ports Edwards, Robertson & Co., Cardiff, report: "There has been a falling off in the quantity of tin plates shipped in November as compared with those of the past few months. Recent reports from the States appear to indicate more activity in some of the important branches of trade, but so far it has not affected freights from this channel, which are still very low, running about 7/6 to New York. We are, however, inclined to believe, from the stronger inquiry that now exists, that the outward freight market will certainly have an upward tendency, more especially if the homeward rates continue in the present depressed state." Steel is very quiet indeed in almost all the branches of the trade, particularly at Sheffield. Many of the rolling mills there are on short time, and orders for steel to be used up in the staple trades of the town are exceptionally scarce. Such pronounced dullness has not made itself felt for many years past at this season, when a spurt is usually experienced prior to the Christmas holidays. The Bessemer works are quiet, save where they have orders on hand for steel sleepers or billets for rolling purposes. The Siemens concerns are still fairly well employed in Scotland and South Wales. In view of the overproduction of rails and the limited demand for them it is surprising that some of the works do not turn their attention to the production of rolled girders, either of iron or steel, which are in good demand, and can be sold at a respectable profit. Steel rails are steady, but not active, although the makers are rather more hopeful than they were a few weeks ago. Prices are as before. The difficulty in the association is likely to be settled shortly at a meeting to be held on the Continent. The Victorian order for 40,000 tons has not gone to Germany direct, but has been taken by a firm of merchants in London.

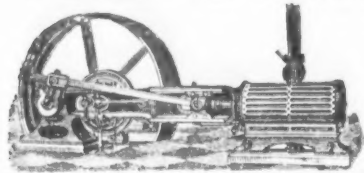
TIN PLATES.

In London there is really no change of any note in the market, makers remaining very firm, and in most instances having plenty of orders in hand. Still the American buyers are keeping very quiet and ostensibly placing few orders. I quote ordinary IC cokes, buyers 14/ and sellers 14/6 @ 15/, f.o.b. Liverpool. In London the demand for tin plates, though not brisk, is pretty well sustained for certain sorts, more especially coke tin plates and Bessemer steels with coke finish. There has also been a pretty fair demand for Siemens steel with coke finish. The demand for charcoal tin plates is somewhat better, and so is that for charcoalterne plates, but coke ternes are rather at a discount just now, and, in fact, have been so for some time. The inquiries for coke tins and Bessemer steel, coke finish, include a variety of sizes and substances, some of which are Continental and Colonial orders. The prices of Bessemer is maintained pretty firmly at 15/6 IC for all good brands in specialties as to sizes, &c., with the usual extras, and coke tins are still 14/3 @ 14/6 IC for ordinary kinds, though for the better class brands 14/9 @ 15/ IC are the figures still firmly maintained. The Siemens steel plates with coke finish, not being in quite so much request, are not so firm as they were, and these are obtainable in some instances at 15/3 IC for favorable specifications, though for others the price is still 15/6 IC. Ternes are still pretty firm at 14/ @ 15/ IC. Coke-tin wasters and Bessemer steel wasters are both in good request at from 13/ to 13/6, though there are many brands which cannot be obtained even now under 13/9 @ 14/. Prices will remain pretty firm, I have no doubt, so long as the combination to reduce the make continues, and no longer, whatever the demand may be.

THE HARDWARE TRADE.

In London it is a little too early to speak of the Christmas trade, for it has barely opened for the retailers yet. Still, judging from the stock orders given out, a fair average business is anticipated. There has been a steady business looked for merchants during the past few weeks, but very few houses speak cheerfully of trade, and in respect of the home demand the recent wet weather, the elections and the nearness of the end of the year have combined to check buying materially. The Australasian markets are generally heavily stocked, and in some lines there is quite a glut; hence the mails have not been bringing very heavy order

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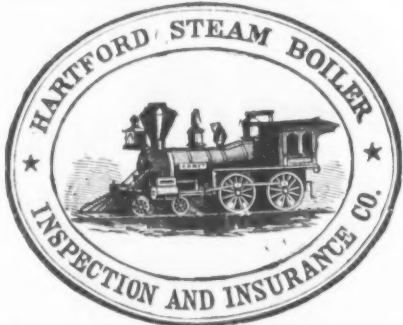


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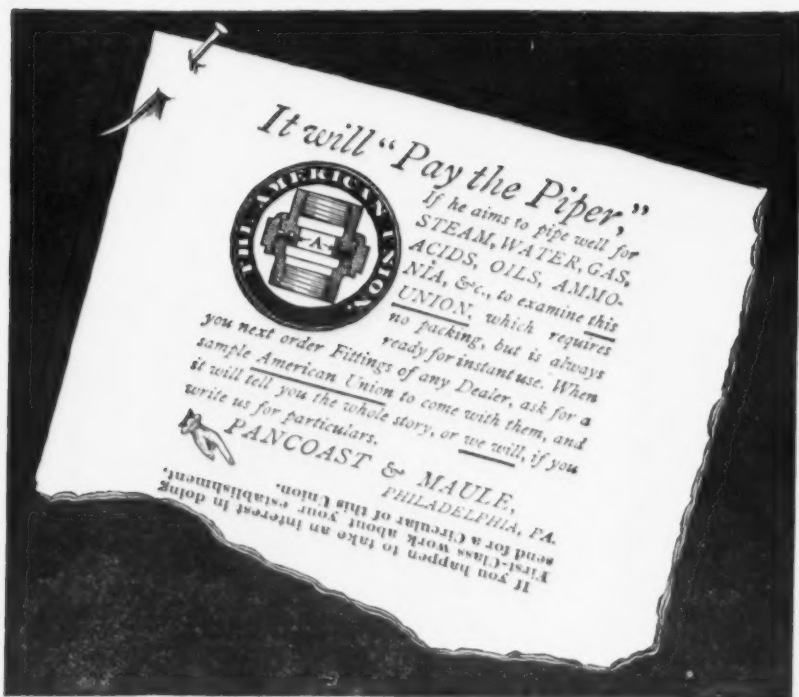
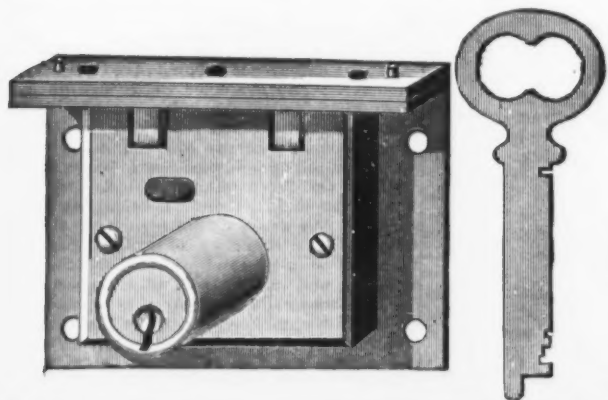
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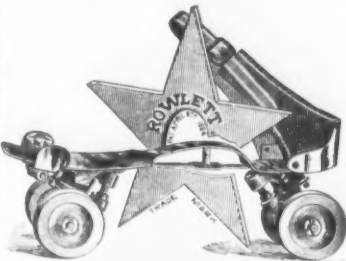
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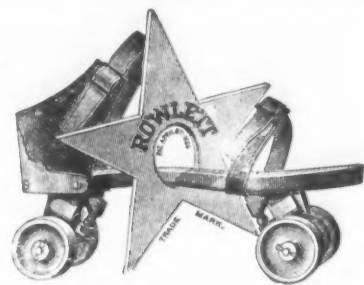
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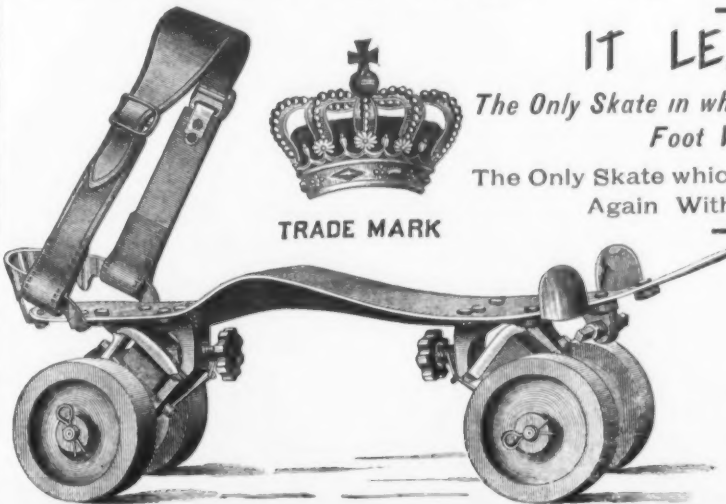


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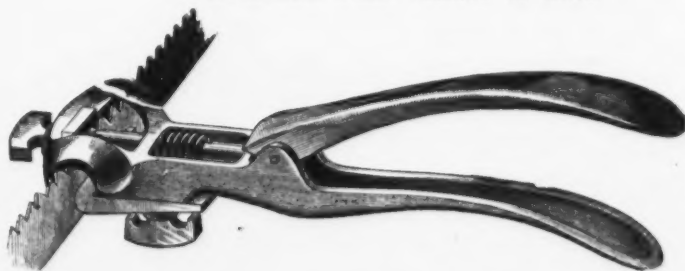
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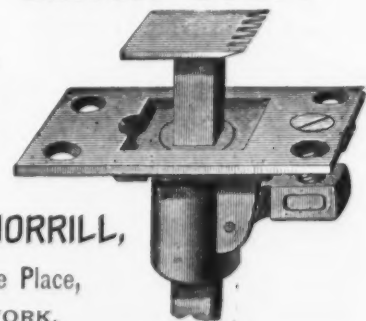
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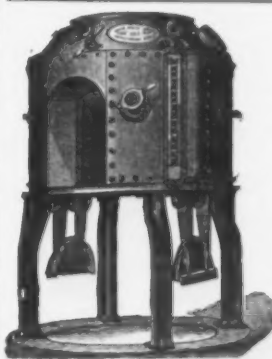
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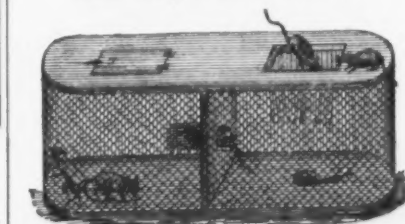
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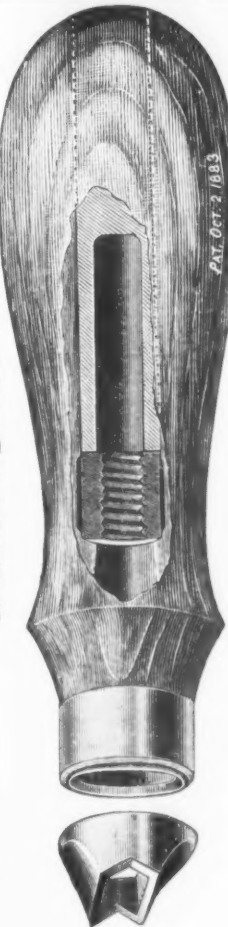


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sheets lately. South America and India are not such good customers as they otherwise would be the rates of exchange more favorable. Indian buyers have been making inquiries for both heavy and light hardware pretty freely of late, but the limit of price in many instances has been so low that the orders have not found takers. At Birmingham business is resuming its normal channels, and orders, more particularly for culinary utensils and furnishing goods, are coming in freely from all parts of the country. The orders, however, are in almost every instance for small quantities to meet immediate requirements, and there is little or no buying for stock, even in metals. The advance lately notified in ingot bars is scarcely maintained, and consumers in most cases refuse to pay it. Iron is, if anything, weaker, in view of a probable reduction in wages, and competition in nearly every branch keeps prices down to their minimum. Government requirements contribute to the activity of several local branches, and tin plate workers are hopeful of obtaining shortly additional contracts for mess tins and similar goods for which the tenders are out. Merchants' orders, as usual at this season, are scarce and scanty, but the Australian Colonies continue to take large quantities of miscellaneous hardware in addition to galvanized sheets, of which the shipments lately have been exceptionally heavy. At Wolverhampton the tendency is to delay the placing of fresh orders for manufactured iron until after the arbitration upon the wages question in Birmingham, and consumers are satisfied with placing hand-to-mouth orders. By a diligent looking up of specifications, however, ironmasters are able to keep the mills and forges going with a fair amount of regularity. At Sheffield the heavier classes of the iron and steel trade have undergone but little change during the last few weeks. The rolling and plate mills and the heavy forging, foundry and engineering establishments are in the main but scantily supplied with orders and business generally in these departments is tapering off in view of the closing of the year's accounts. Railway orders in particular are light, and the demand for constructive iron and steel work is at a very low level. The crucible steel manufacturers give an encouraging account of the orders for ordinary merchant steel, and the demand for high-class tool brands exhibits a diminishing tendency. The steadiest and most satisfactory portion of the export trade in cast steel is that which comes from France and Germany.

Latest Legal Decisions.

SALE OF IRON—QUALITY NOT ACCORDING TO CONTRACT.

P., of New York, sold to A., of Milwaukee, 500 tons of No. 1 extra American pig iron, to be delivered on the cars at Coplay, Pa., but by agreement the place of shipment was changed to Elizabethport, N. J. Before the iron was received it was paid for, and the freight from Coplay as well. Soon after it was received A. examined the iron and refused to accept it, and at once gave P. notice of this rejection and advised him that he held it subject to his order. A. demanded the return of the price and the freight paid, and on P.'s refusal sued him and recovered a judgment in the United States Circuit Court for the Eastern District of Wisconsin. The defendant contended that the title having passed to the plaintiff on the delivery of the iron on the cars at Elizabethport he could not—there being no fraud—rescind the contract and sue for the money paid on it, but must rely on the warranty and bring his action on the breach of it and recover as his damages the difference in the value of the iron. On the case—Pope vs. Allis—being carried to the Supreme Court of the United States, the judgment was there affirmed. Mr. Justice Woods, in the opinion, said: "It did not appear that at the date of the contract the iron had been manufactured, and it was shown on the trial that no particular iron was set aside and appropriated to the purchaser until about the time of its shipment. The purchaser had no opportunity to examine the iron before it reached him at Milwaukee, and therefore never accepted the particular iron appropriated to fill the contract. It was shown that the iron delivered was not that bought, as to its quality, and the contention of the seller cannot be maintained. When the subject matter of a sale is not in existence or not ascertained at the time of the contract, an undertaking that it shall, when existing or ascertained, possess certain qualities, is not a mere warranty, but a condition the performance of which is precedent to any obligation on the purchaser under the contract to receive it or pay for it, because the existence of those qualities being part of the description of the thing sold becomes essential to its identity, and he cannot be obliged to receive and pay for a thing different from that for which he contracted. The plaintiff's action to recover his payments was properly brought, and the judgment he has secured must be affirmed."

BILL OF LADING—GOODS NOT DELIVERED.

W. sued a railroad company on their bill of lading for the value of cotton consigned to them, as the bills showed, but not delivered. On the trial it appeared that one Estes, on May 10, took to a railroad station in North Carolina 10 bales of cotton and received from the station agent a bill of lading therefor, in which the cotton was consigned to plaintiff, but that this cotton, instead of being forwarded to plaintiff, was sent, on another bill of lading issued to Estes, to another consignee; and that, on May 17, Estes took two bales of cotton to the same station, and procured from the station agent a bill of lading for eight bales, in which the plaintiff was also the assignee. On both of these bills the plaintiff made advances, and securing but two bales of cotton, he demanded the remaining 16 bales, and they not being forthcoming he sued the company for their value. In this case—Williams vs. Wilmington and Weldon Railroad Co., the Supreme Court of North Carolina, through the Chief Justice (Smith) decided: "That the company was liable for the 10 bales delivered to the station agent on May 10, upon the bill of lading, for the cotton came into

the possession of the company, and if it issued a second bill of lading, which it might do by impounding the first bill issued, it was bound thereby. 2. But as to the eight bales, having actually received but two of them, it is bound for two bales only, though its agent had given a bill of lading for the eight bales. A carrier may show in contradiction of a bill of lading given by its agent that the goods were not received, and so avoid any liability on the bill. The authority of the agent to issue the bill depends upon the actual delivery of the goods. The decisions are clear that, though an innocent third party has advanced money on the faith of a bill of lading, the carrier may show that the goods were not delivered to it, and be discharged from any liability on the bill. As to the six bales not received and not delivered, the company is not to be held responsible; it must only pay for 12 bales—10 and 2."

LIBEL—DESIGNATING A MAN AS A "HOG."

P., in an article in a local paper, spoke of S. as "a hog," and the latter sued him in libel and recovered a judgment. The case—Solverson vs. Peterson—was carried to the Supreme Court of Wisconsin, where the judgment was affirmed. Judge Orton, in the opinion, said: "Is not the use of this term most intensely contemptuous, and does it not tend and was it not intended to bring the plaintiff into ridicule and contempt and to injure his standing and reputation as a citizen? How could a man be lower, meaner or more filthy than to have the character, habits and ways of a swine? Of course no one would understand that the defendant intended to charge the plaintiff with being veritably a hog. He is compared with this low and filthy animal to indicate that he has fallen to the lowest degree of human degradation, morally, physically, intellectually. Words which hold the plaintiff up to contempt, hatred, scorn or ridicule are libellous. This is the common definition of libel. Is it difficult to see that these words fall within this definition?"

BILL OF EXCHANGE—PURCHASE BEFORE ACCEPTANCE—PAYEE'S RIGHTS.

A foreign bill of exchange, dated February 23, and payable 30 days after date, was not accepted until March 1, and in the meantime A. bought it, and he took it in the regular course of business from the drawer on the day of its date for value. On the refusal to pay A. sued O., the acceptor, who set up as a defense a want of consideration between himself and the drawer, and the trial court ruled that the holder was bound to prove that the acceptor had waived the consideration or he must be defeated. The jury therefore found for the defendant, and judgment was entered in his favor. The plaintiff carried the case—Arpin vs. Owen—to the Supreme Judicial Court of Massachusetts, where the judgment was reversed. Judge Allen, in the opinion, said: "The rule that the title of an assignee cannot be impeached by showing want of consideration for the original debt is applicable to the indorsee of a note and to the payee and to the indorsee of an accepted bill. How was he to know what had passed between the drawer and the acceptor. It is contended that this rule does not apply to this case, because the acceptance was after the bill was purchased by the payee, and that, therefore, it was not taken by him on the faith of the acceptance. There is no ground for this distinction. It is immaterial when an acceptance is made. It may be made at any time, and the rights of the payee and the indorsee are the same after it is made, whether they were acquired in anticipation of it or subsequent to it. The instrument is negotiable before acceptance, and the acceptance is an acknowledgment of the debt it represents and an absolute promise to pay it to the person who is or who shall become the holder of the bill, and to allow a want of consideration for the acceptance to defeat the right of a holder in good faith for value whenever he became the owner would be contrary to the nature and purpose of bills of exchange and to the uniform usage in regard to them."

RAILROAD.—MASTER AND SERVANT.—LIABILITY FOR EMPLOYEE'S CONDUCT.

A railroad company was sued for damages for the death of L.'s son, who was run over and killed under the following circumstances: S., the driver of the feed-car, whose duty it was only to drive the car between certain points, was in the habit of allowing boys to ride on the platform with him, and when they were troublesome to him he ordered them to leave the car. On this occasion L.'s son in leaving the car on being directed to leave it, was pushed by B., another boy, and he fell under the car and was crushed so that he died. The driver, as was his custom, brought his mule to a walk when the boys were getting down. In this case—Lott vs. New Orleans, C. and L. R. R. Co.—the plaintiff was defeated, and on appeal the Supreme Court of Louisiana affirmed the judgment. The Chief Justice (Bernandez), in his opinion, said: "Had the boy, who was 11 years old, and, like all newsboys, as he was, smart, active and alert, not been pushed by his companion, he would doubtless have escaped unhurt. The rules which govern in negligence as to mere children do not apply to minors who have attained to the years of discretion. But, in order to hold the company liable, it must appear that the injury was occasioned by the negligence of the driver while in the exercise of the functions in which he was employed; that it was the natural and probable result of the driver's order to leave the car—such a consequence as he might and ought to have reasonably foreseen at the time; that he had done or omitted an act which was something contemplated by his employment, and which, if done or omitted, would have been done or omitted in his employer's name. In this case there could be no recovery. It is manifest that the company never designed the platform of the feed car to be used for the transportation of passengers; that the driver's authority was limited to taking the car from one designated point to another, and that he had no power to admit passengers upon the car. And it is clear that these boys were mere intruders. It would be a strange result if an employer should be held liable for the reckless carelessness of intruding boys upon a mere transportation car driven by one who allowed the boys to get on it."

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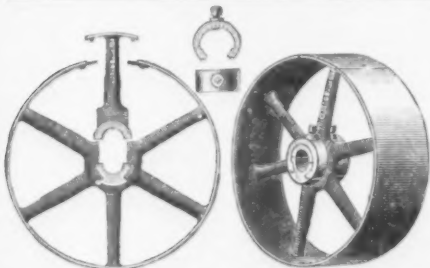
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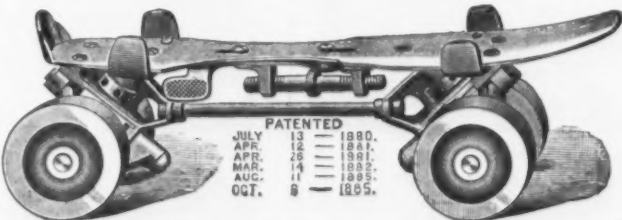
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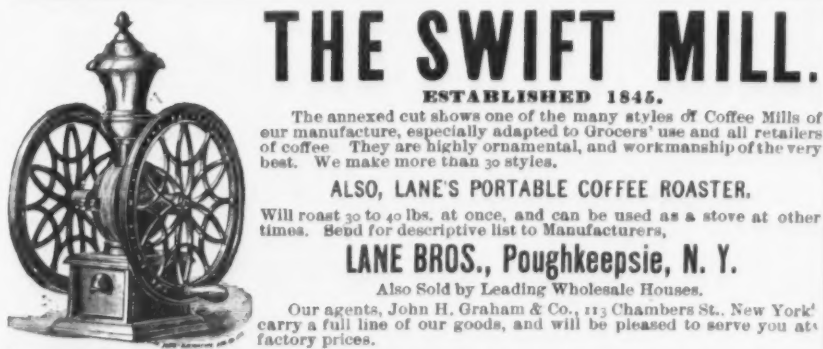
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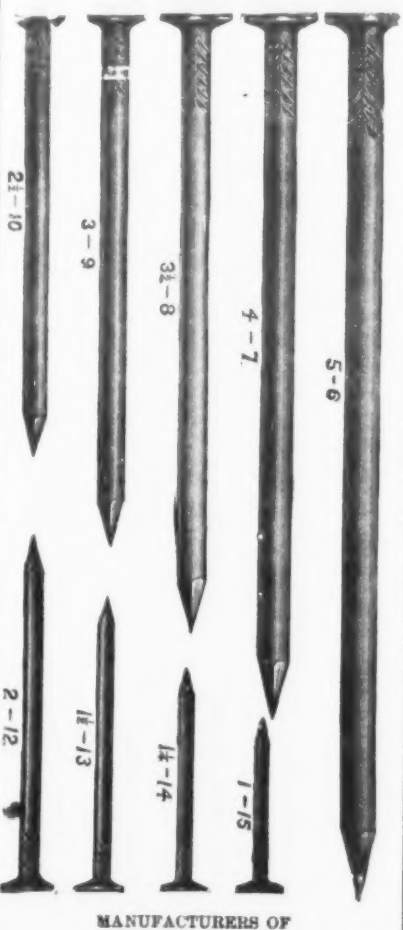
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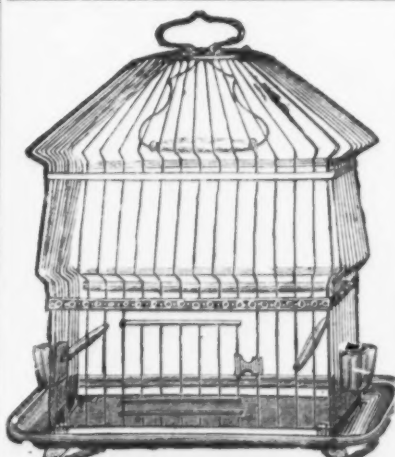


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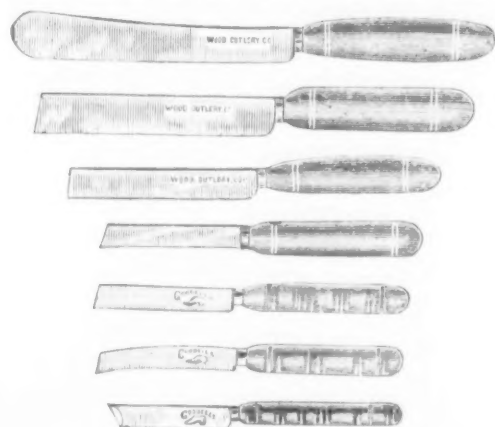


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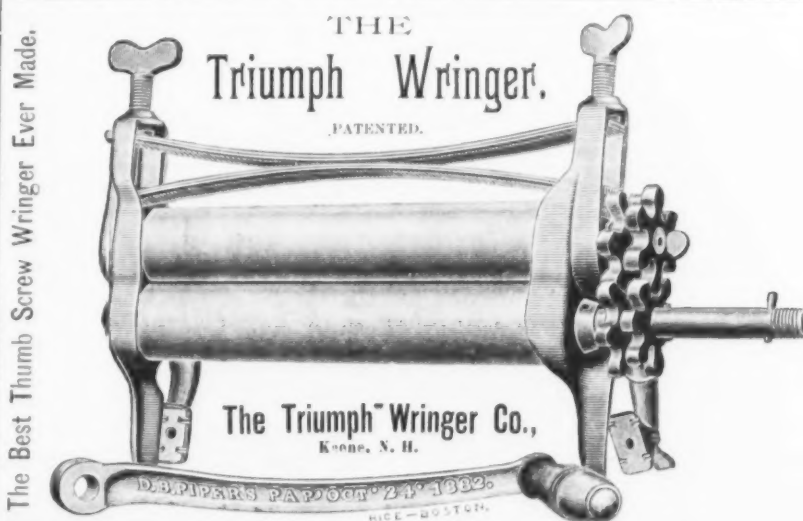
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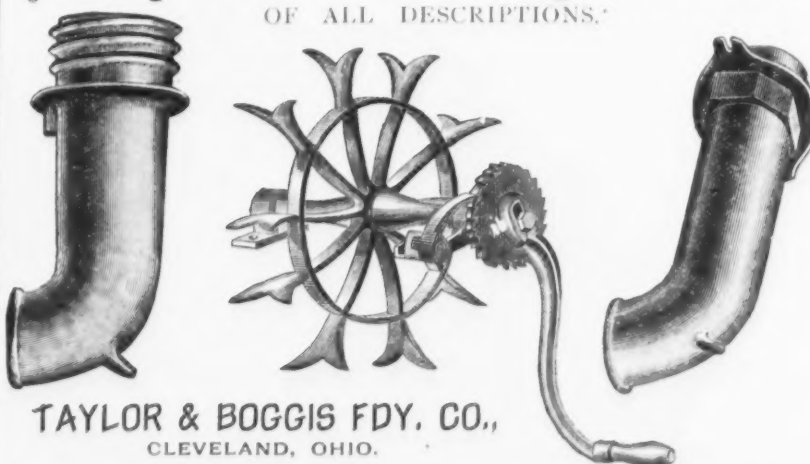
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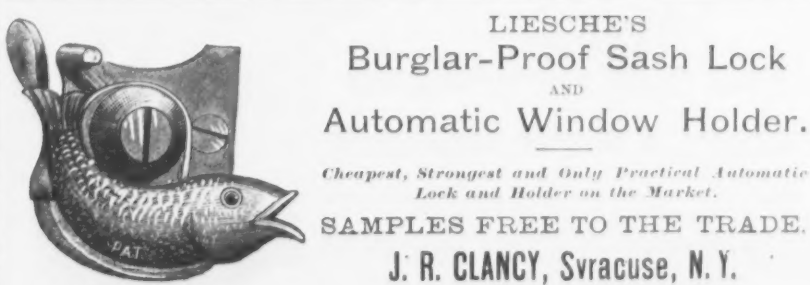


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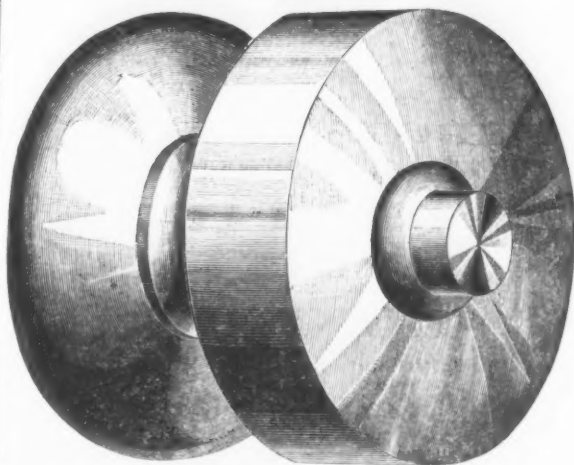
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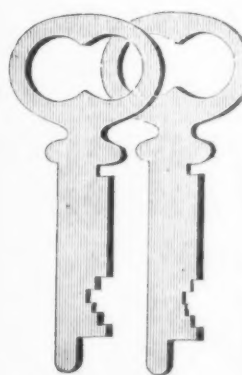
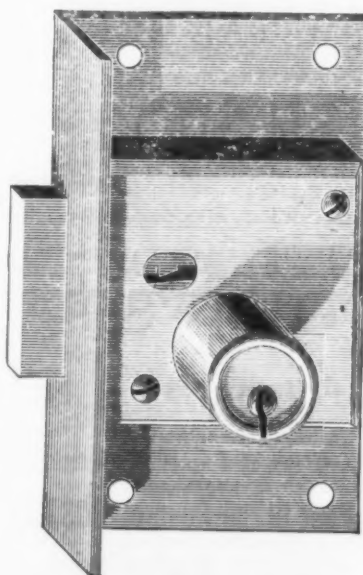
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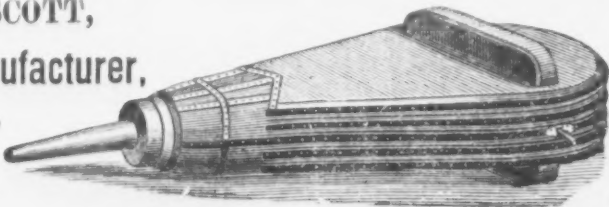
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 name indicates, the Latest Wonder, and by actual test we decide an advantage of 20 per cent. over
 our former world-renowned Lightning Saw. Having newly organized January 25th, 1885, as the E.
 M. Boynton Saw and File Co., we shall be prepared to fill any orders for the above, as well as for
 goods which have been furnished our customers throughout the world for the last 14 years.

Respectfully yours,
E. M. BOYNTON SAW AND FILE CO., 99 Chambers St., New York.

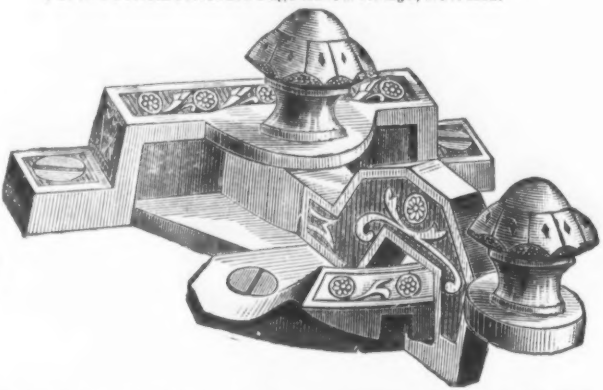
GEO. M. SCOTT,
Bellows Manufacturer,

Johnson Street,
 Cor. 224 St.,
 CHICAGO, ILL.



For Net Bottom Prices see Page Adv. Iron Age, Nov. 26th.

BURGLAR-PROOF SASH LOCKS.
(Patented Oct. 7th, 1879.)
FOR NET BOTTOM PRICES SEE PAGE AD.
IN IRON AGE, Nov. 26th.



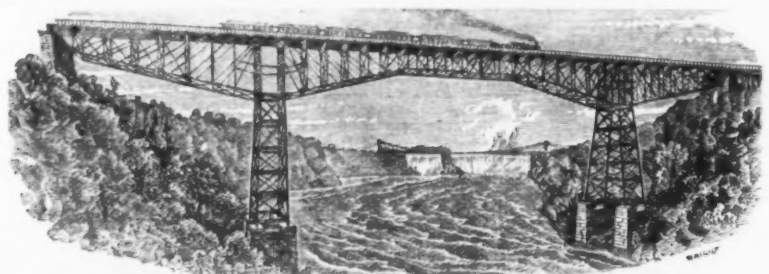
No. 210, Ornamental Iron, Iron Knob, fine finish, \$0.60
No. 211, Ornamental Iron, Iron Knob, fine finish, \$0.75
No. 212, Ornamental Iron, Iron Knob, fine finish, \$0.85
No. 213, Ornamental Iron, Iron Knob, Nickel-plated, \$1.25
No. 214, Ornamental Iron, Iron Knob, Nickel-plated, \$1.50
No. 215, Ornamental Iron, Iron Knob, Nickel-plated, \$1.60
No. 216, Ornamental Iron, Iron Knob, Nickel-plated, \$1.75

No. 21, Ornamental Iron, Iron Knob, Nickel-plated, \$1.85
No. 218, Ornamental Iron, Iron Knob, Nickel-plated, \$1.90
No. 219, Ornamental Iron, Iron Knob, Nickel-plated, \$1.95
No. 220, Ornamental Iron, Iron Knob, Nickel-plated, \$2.00
No. 221, Ornamental Iron, Iron Knob, Nickel-plated, \$2.05
No. 222, Ornamental Cast Brass, Polished and Lacquered, \$2.50
No. 223, Ornamental Cast Brass, Nickel-plated, \$3.00

MANHATTAN HARDWARE CO., READING, PA., U. S. A., LOCKES OF Every Description, AND A FULL LINE OF GENERAL BUILDERS' HARDWARE.

Special net prices to be found in *Iron Age* whenever changes occur.
The only manufacturers in the United States who quote bottom prices to all dealers without favoring any class.
Fine Gray Iron Castings of every description, also Real Bronze and Brass Castings, made to order at very low prices: Pattern Making, Japanning, Bronzing, Tinning, &c.
Our goods are known and liked wherever sold.
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Charles Kellogg, Thos. C. Clarke, C. S. Maurice, Geo. S. Field, Edmund Hayes, C. Macdonald.
CIVIL ENGINEERS

And Constructors of Iron and Steel Bridges, Viaducts, Roofs, Elevated Railroads, Marine Piers, Etc.

Works: Athens, Pa. Works: Buffalo, N. Y.
Late Kellogg & Maurice. Capacity, 14,000 tons. (Late Central Bridge Works.) Capacity, 15,000 tons.

DESIGNS AND ESTIMATES WILL BE SENT ON APPLICATION TO
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Steel Door Hangers

FOR EVERY PURPOSE.

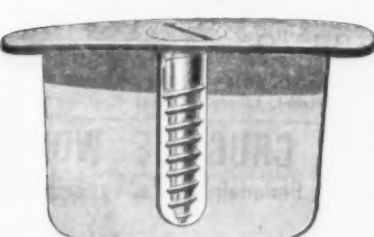


Anti-friction Steel Barn Door Hangers.
Three sizes of Steel Common Hangers.
Anti-friction Steel House Door Hangers.
Heavy and Extra Heavy Anti-friction Hangers for Warehouses, Freight Depots, &c.
Anti-friction Steel Elevator Hangers for Iron or Wooden Doors.
Special shapes and sizes of Hangers made to order.
All Hangers made for either Iron or Wood Track.
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Track Brackets, Stay Rollers, Combination Latches, Automatic Gate Hinges.
The most complete and finest line of these goods manufactured.
Prices the lowest. Catalogues and Lists on application.

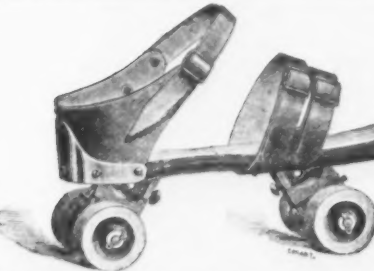
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Hub Malleable Iron Axe Wedges.



PATENTED NOVEMBER 21, 1882.
It Can be Taken Out Easily.
The screw holds the wedge in place. Take out the screw and the wedge can be easily removed, allowing the handle to be withdrawn from the axe. Try them and you will buy no other. Send for sample.
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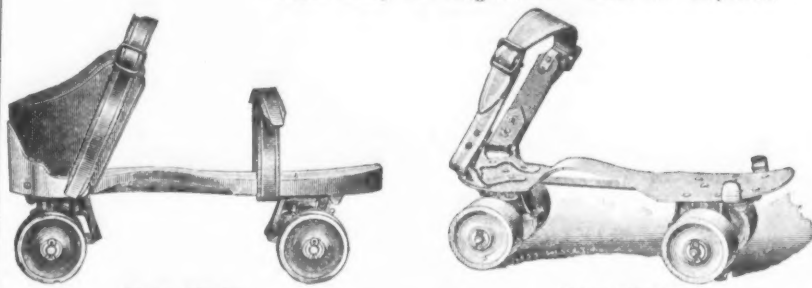
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Made of the very best materials: simple in construction; light and neat in appearance; noiseless in movement; easy to keep in order; finished in thorough and workmanlike manner; warranted to possess all the qualities and requirements necessary for use. Rubber Cushion held in Patent Adjustable Box; can be raised or lowered at pleasure to take up all wear.
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H. W. ABORN, Treasurer. JOHN B. POWELL, Gen'l Manager.
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Save Electric Apparatus for all the various modes of lighting and transmitting of Power are in operation. No other system is as economical in installation and maintenance. No other Electric Light is as durable—the first machines made are still in daily operation.
The System
Comprises
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Ball Bearing and Ratchet Movement.
Most Easy for Beginners. Best for Experts.



Rink Skate. MANUFACTURED BY Club Skate.

EUREKA SKATE CO., Richmond, Ind.

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For Either Wholesale or Retail Trade.

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PRICES IN SETS.

Set No. 1. Includes all the numbers, 1 to 32 inclusive. Price, \$10.00 per Set.
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Write for a Circular giving detailed description and Price of each Card. They are sold separately at prices ranging from Twenty to Seventy Cents Each. Twenty numbers out of the Thirty-two are Thirty Cents Each. Unmounted Price Sheets can be furnished at half the Price of Mounted. Postage stamps can be enclosed for Sample cards or amounts of less than One Dollar. Full sets will be sent, subject to approval, to parties willing to prepay return charges on any numbers not suited to their use.

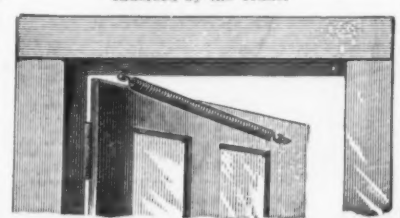
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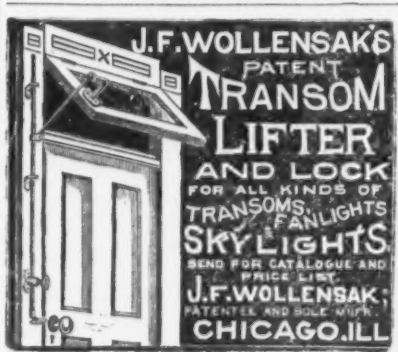
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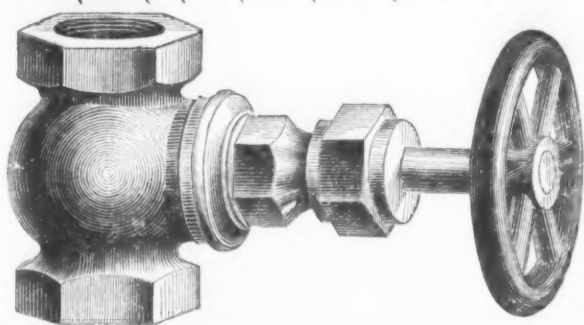
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Light Castings a Specialty.

N. Cor. 23d and Race Streets,
PHILADELPHIA.

Correspondence solicited.

Cutlery.—Pocket American Shear Co.'s.....	dis 25
Butcher Knives, Wood's, Lap Bolster, Square Handle.....	dis 10
Steak Knives.....	dis 10
Lap Bolster, Oval Handle.....	dis 10
Stick Knives.....	dis 10
Skinner's.....	dis 10
Butcher, Common Round Handle, Wood's.....	dis 10
Shoe Knives, Wood's.....	dis 10
Dividers.—Cook's.....	dis 25
Dog Collars.....	dis 25
Door Springs.—T. C. Rod.....	dis 10
Initiation Torrey's Rod.....	dis 10
Gem Coll, new list.....	dis 50
Crown.....	dis 10
Warner's.....	dis 10
Door Stops.—Thurston's.....	dis 10
Drawer Knobs.—Thurston's.....	dis 10
Drills.—Morse Pitt Stock.....	dis 10
Morse Straight Shank.....	dis 10
Emery.—Wellington Mills.....	dis 10
Walpole Emery Mills.....	dis 10
Turkish, in 10 b cans.....	dis 10
Enamelled Ware.—Standard Mfg. Co. Kettles.....	dis 10
Standard Sauce Pans.....	dis 10
Felloe Plates.—Wrought.....	dis 10
Files.—American File Co.....	dis 10
Nicholson File Co.....	dis 10
Fluting Machines.—Knox List.....	dis 10
Forks.—W. C. & Co.....	dis 10
Eastern Tool Co's. Manure.....	dis 10
Gimlet Bits.....	dis 10
Genuine German, No. 125, 132 to 132.....	dis 10
Pierce's.....	dis 10
Glass Cutters.—Combination Glass Cutter and Knife Sharpener.....	dis 10
Grab Hooks.—K. P. & Co's No. 2, 11.50.....	dis 10
Hammers.—Maydole's.....	dis 10
Hartford Hammer Co.....	dis 10
Hangers & Rollers.—Anti Friction.....	dis 10
Acme Rollers.....	dis 10
Clings.....	dis 10
Common Hangers.....	dis 10
Common Rollers.....	dis 10
Victor Hangers.....	dis 10
Victor Roll.....	dis 10
Hand Screws.....	dis 10
Hatchets.—C. F. Dowse, new list.....	dis 10
Underhill.....	dis 10
Hay Knives.—Lighting.....	dis 10
Hinges.—Strap and T. new list.....	dis 10
Provident, Yale.....	dis 10
Wrought Screw Hook.....	dis 10
Hoos.—Eastern Tool Co.....	dis 10
W. C. & Co's.....	dis 10
Hooks and Staples.—Brewers (new list).....	dis 10
Horse Nails.....	dis 10
Putnam Pointed.....	dis 10
Bridge Water.....	dis 10
Ice Cream Freezers.—Packer's, new list.....	dis 10
Knobs.—"Norwalk" New list.....	dis 10
Silver Glass Bell Pulls.....	dis 10
Silver Glass Bell Pulls.....	dis 10
Lanterns.—Tutunars, No. 0.....	dis 10
Lawn Mowers.....	dis 10
Continental.....	dis 10
Quaker City.....	dis 10
National.....	dis 10
Leaf, Sheet.....	dis 10
Locks.—Norwalk.....	dis 10
Eagle Cabinet.....	dis 10
Eagle Trunk.....	dis 10
Mallory, Wheeler & Co.....	dis 10
Manure Forks.—W. C. & Co.....	dis 10
Eastern Tool Co's.....	dis 10
Mattocks.....	dis 10
K. P. & Co, Long Cutter, \$16.00 & 42.....	dis 10
K. P. & Co, Short Cutter, \$15.50 & 42.....	dis 10
K. P. & Co, Pick Cutter, \$16.00 & 42.....	dis 10
Measuring Tapes.—Eddy's.....	dis 10
Meat Cutters.—Miles' Challenge.....	dis 10
Hale's (new list).....	dis 10
American.....	dis 10
Money Drawers.—Tucker's Alarm.....	dis 10
Mouse Traps.—Delusion.....	dis 10
Novelty.....	dis 10
Nails.....	dis 10
Oilers.—Zinc and Tin.....	dis 10
Brass and Copper.....	dis 10
Ox Hoes.—Extra finished and varnished.....	dis 10
1 1/2 in. & 2 in. pair.....	dis 10
1 1/2 in. & 2 in. pair.....	dis 10
Paper.—Common Tarred Sheathing.....	dis 10
Eagle Brand Tarred Sheathing.....	dis 10
Common, Dry Sheathing.....	dis 10
Eagle Brand Dry Sheathing.....	dis 10
Picks.—K. P. & Co, Adze Eye, 5 to 6 in.....	dis 10
K. P. & Co, Adze Eye, 6 to 7 in.....	dis 10
Planes.....	dis 10
Auburn Tool Co, Bench.....	dis 10
Auburn Tool Co, Fancy.....	dis 10
Auburn Tool Co, English Iron.....	dis 10
N. Y. Tool Co, Bench.....	dis 10
Plated Ware.—Rogers & Bro.....	dis 10
Pliers.—Vom Clegg & Co.....	dis 10
Butt's Wire Pliers.....	dis 10
Plumb & Levels.—Stanley R. & L. Co.....	dis 10
Pointo Diggers.—W. C. & Co, reduced list.....	dis 10
Eastern Tool Co.....	dis 10
Palley's.—Acme or Excelsior, 1 1/2 in.....	dis 10
Acme or Excelsior, 2 in.....	dis 10
Pumps.—Union Manufacturing Co.....	dis 10
Iron Castern.....	dis 10
Iron Pitcher Spout.....	dis 10
Laundry.....	dis 10
Tailors' Gage.....	dis 10
Enterprise "Potts".....	dis 10
Sash Locks.—Kling & Hutchinson's, new list.....	dis 10
Sandpaper.—Baeder & Adamson.....	dis 10
Sash Weights.—Patent Eye.....	dis 10
Saws.—Hand Saws, Diston's.....	dis 10
Diston's Common Tooth.....	dis 10
Diston's Great American Tooth.....	dis 10
Boynton's Lightning Tooth.....	dis 10
M. H. & Co, Hand Saws.....	dis 10
Richardson Bros.....	dis 10
Saw Blades.—Diston.....	dis 10
Welch & Griffith, Extra.....	dis 10
Welch & Griffith, No. 2.....	dis 10
Scales.—Fairbanks.....	dis 10
Screws.....	dis 10
Flat Head Iron.....	dis 10
Round Head Brass.....	dis 10
Round Head Iron.....	dis 10
Griffith Round Head Nickel Plated Common.....	dis 10
Seymour's.—Clippers in boxes.....	dis 10
Shaves, Limball's.....	dis 10
Watrous.....	dis 10
Shears.—American Shear Co, new list.....	dis 10
Shot.—Le Roy.....	dis 10
Shovels.—O. Ames, new list.....	dis 10
O. Ames, other brands, new list.....	dis 10
Sinks.—Mace Patent.....	dis 10
Snow Shovels.....	dis 10
Skates.—I. Mohr.....	dis 10
Union Roller.....	dis 10
Stocks and Dies.—Kling's.....	dis 10
Tacks.....	dis 10
Swedes Tinned.....	dis 10
Swedes Iron.....	dis 10
Gump and Laces.....	dis 10
Copper Tacks.....	dis 10
Traps.—Oneds, genuine.....	dis 10
Oneds, imitation, H. & N.....	dis 10
Vices.—Simpson's Adjustable.....	dis 10
Howard Vice Co.....	dis 10
Prentiss's.....	dis 10
Weather Strips.—Packer's.....	dis 10
Brown's Flexible Rubber.....	dis 10
In 25 feet boxes: No. 1, 1 1/2 in. wide, 1/2 yard.....	dis 10
No. 2, 2 in. wide, 1/2 yard.....	dis 10
No. 3, 3 in. wide, 1/2 yard.....	dis 10
Black Walnut Soring Weather Strips.....	dis 10
Window Springs.....	dis 10
Babcock's No. 3.....	dis 10
Babcock's No. 4.....	dis 10
Wire Cloth.—"Clinton".....	dis 10
Wire Fence.....	dis 10
Washington Painted Barbed.....	dis 10
Washington Galvanized Barbed.....	dis 10
Wire Goods.—Gate Hooks & Eyes.....	dis 10
Wrenches.—A. G. Coo's.....	dis 10
General Mfg. Co.....	dis 10
General Mfg. Co.....	dis 10
Novelty for Common Tube No. 2—10 inch.....	dis 10
Excelsior for Stationary Tube No. 2—10 inch.....	dis 10
Excelsior for Stationary Tube No. 2—10 inch.....	dis 10
Excelsior with Folding Bench No. A—11 inch.....	dis 10
Excelsior with Folding Bench No. B—11 inch.....	dis 10
Novelty Set Tub.....	dis 10
Keystone, Wood Frame No. 14.....	dis 10
Keystone, Iron Frame No. 2.....	dis 10
Zinc.....	dis 10

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For Steam,
Water,
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REDUCTION OF AREA—35 to 43 per cent.



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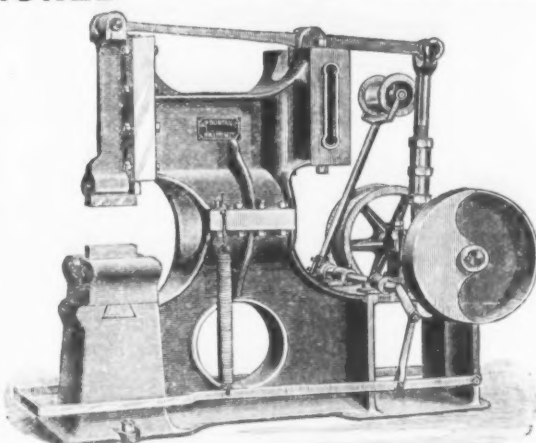
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Burglar-Proof Safes.

CAPACITY: Plates 1 1/4 inch thick to No. 14.
30 feet long.
70 inches wide.

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TRUE, SQUARE, ELASTIC BLOW.
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DURABLE, LOW-PRICED.
Fulfills all the requirements of a First-class Hammer.

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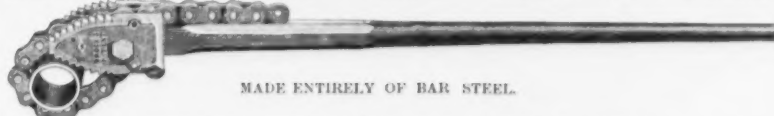
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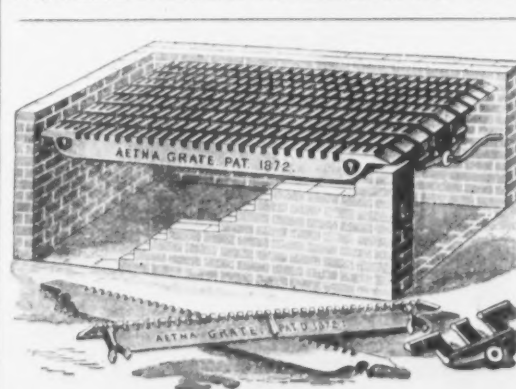
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Improvement Patented April 28, 1885.

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THIS IS A PRACTICAL AND THOROUGHLY SUCCESSFUL

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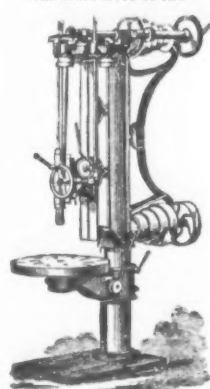
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13,000 in use.

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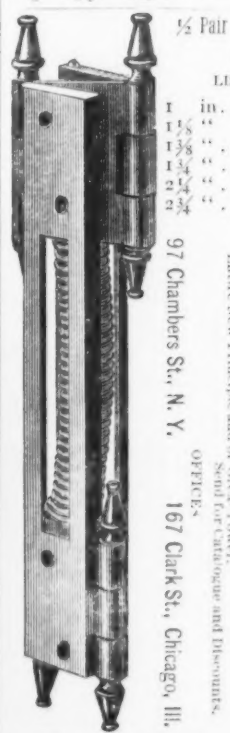
themselves that cannot be

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4 " " " 8 00.

5 " " " 12 00.

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Improved Planers a Specialty: 20 X 20, 22 X 22, 24 X 24,

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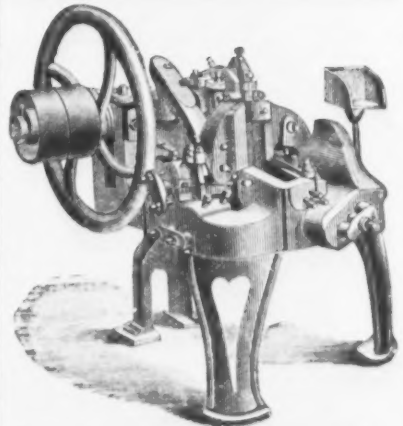
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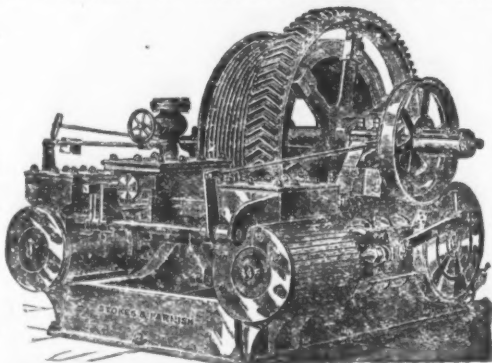
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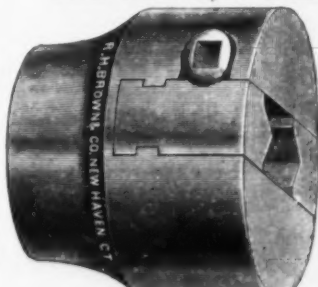
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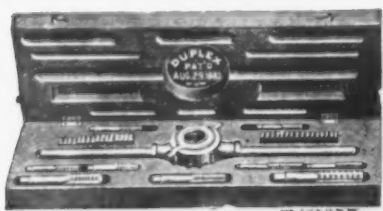
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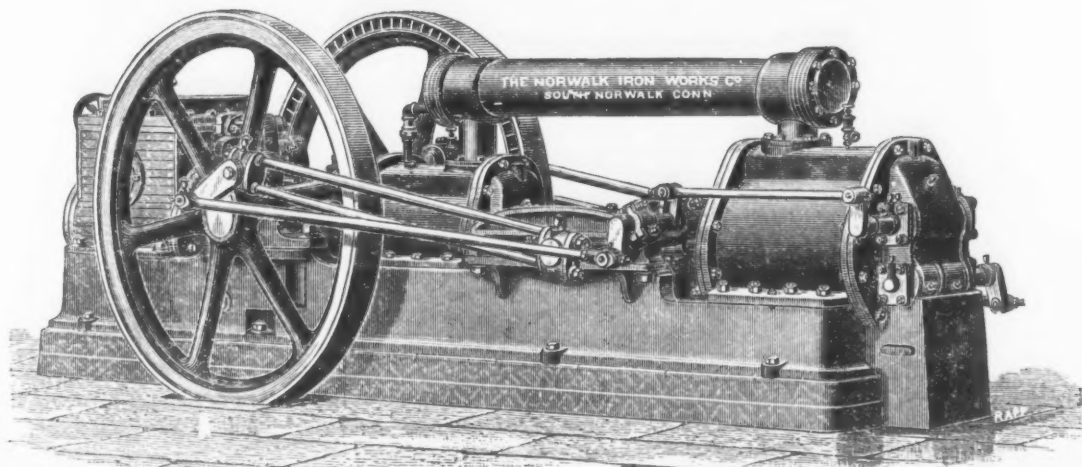
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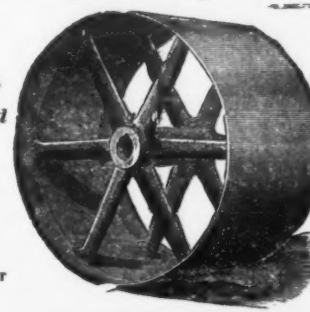
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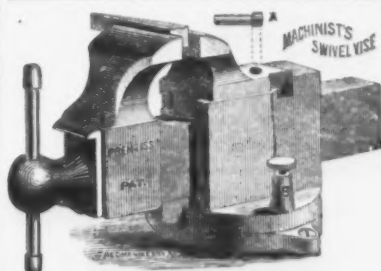
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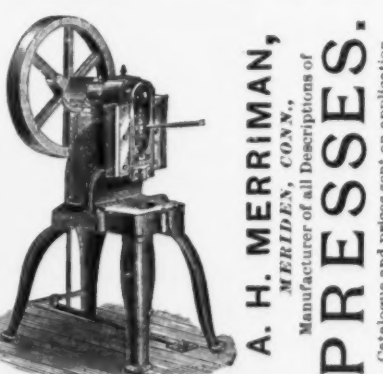
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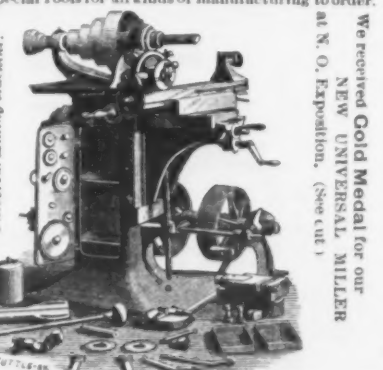


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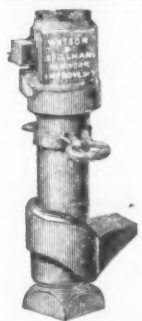
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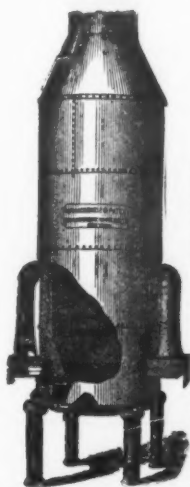
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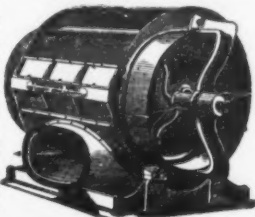
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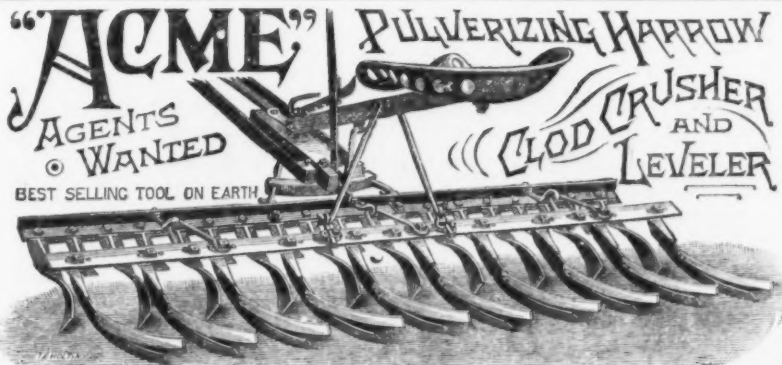
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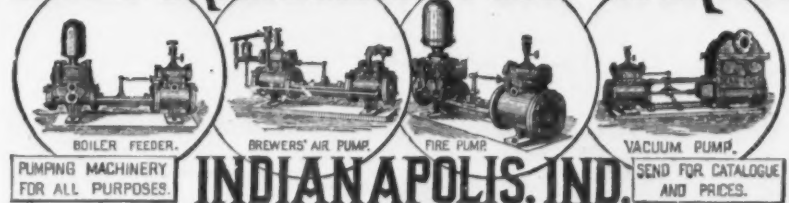
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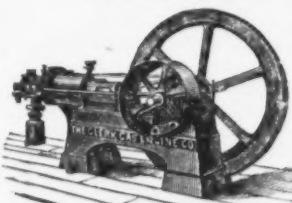
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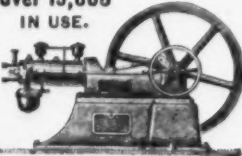
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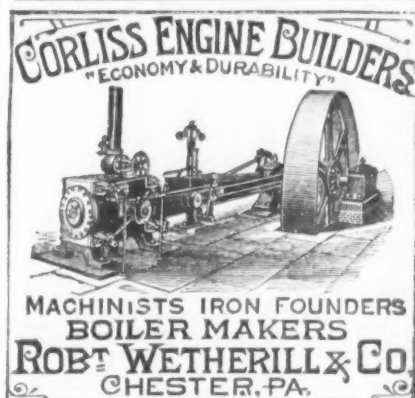
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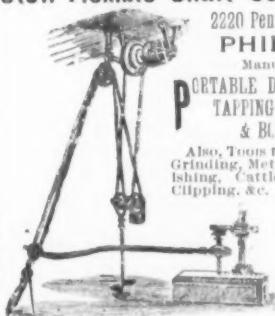
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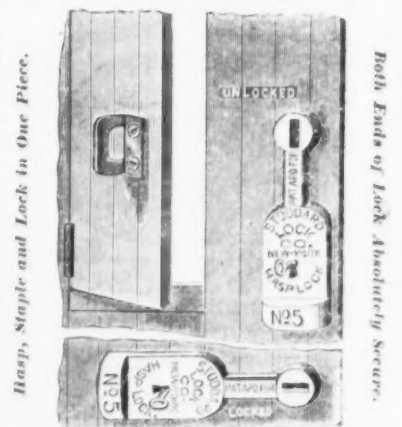
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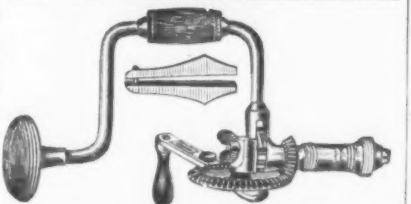
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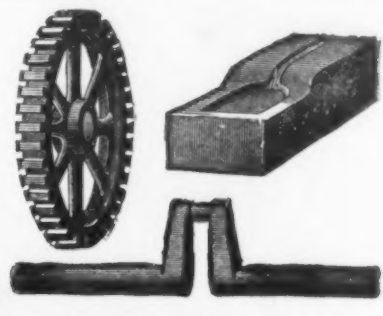
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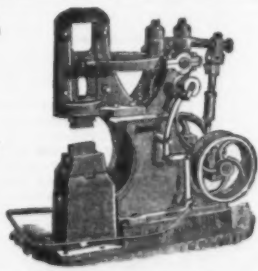
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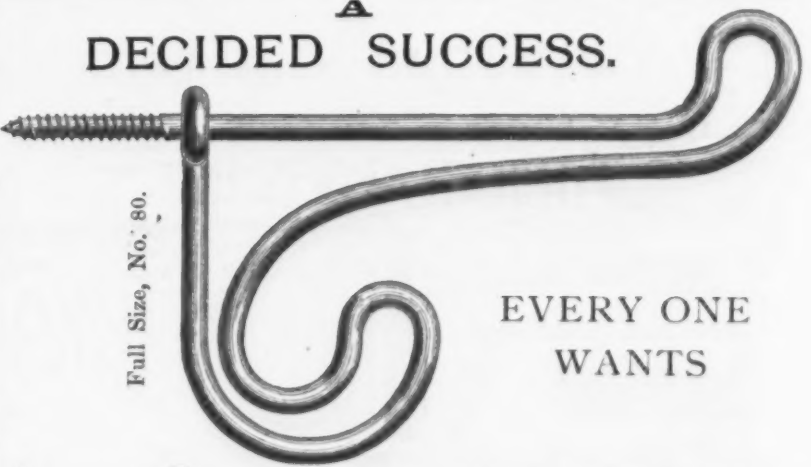


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